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TABULAR VIEW

OF THE COMPARED ATLANTIC

ALPHABETS & GLYPHS

OF AFRICA AND AMERICA.

By Prof. C. S. RAFINESQUE. Philadelphia. **1832.**

LYBIAN.

1. ***Primitive and Acrostic.***

2. ***Old Demotic or Tuaric.***

Meanings and Names of Letters in No. 1.

AMERICAN.

3. ***Letters of Otolum.***

4. ***Glyphs of Otolum.***

Names of Letters in No. 2.

			1.	**2.**	**3.**	
Ear.	AIPS.	A.				A
Eye.	ESH	E.				EI
Nose.	IFR.	I.				IZ
Tongue.	OMBR.	O.				OW
Hand.	VULD.	U.				UW
Earth.	LAMBD.	L.				IL
Sea.	MAH.	M.				IM
Air.	NISP.	N.				IN
Fire	RASH.	R.				IR
Sun.	BAP.	B.p				IB
Moon.	CEK.	C.k				UK
Mars.	DOR.	D.t				ID. ET
Mercury	GOREG	G.				IGH
Venus.	UAF.	V.f				UW
Saturn.	SIASH.	S sh.				ES. ISH
Jupiter.	THEUE.	Th.z.				UZ

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Professor of Historical and Natural Sciences, Member of several learned societies in Europe and America, &c.

Knowledge is the mental food of man.

FIGURES.

Melissa or Balm,	page	14	Tubular shell,	page	127
Mammoth Cave,		27	7 New Fossil Shells,		142
Franklinia,		79	American and Lybian Glyphs		
Fossil Teeth,		100	or Primitive Alphabets,		38

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INDEX.

Agriculture, pages 12, 13, 56.
Alleghany Mts, 105, 157, 188.
American Antiquities, 80, 81, 126, 195.
American History, 6, 8, 51, 56, 85, 98, 117, 127, 193, 197.
Anthropology, 6, 85, 161, 171, 172.
Antidiluvian History of China, 22.
Architecture, 183.
Botany, 15, 16, 78, 119, 121, 144 to 159, 163, 164, 167, 176 to 182, 199, 200, 206.
Chemistry, 12.
Chronology, 23, 117, 130.
Commerce, 32, 166.
Cradle of Mankind, 101.
Domestic Animals, 56.
Education, 91, 183.
Economy, 81, 86, 89.
Geography, 116, 77, 208.
Geology, 26, 27, 30, 65 to 77, 105, 115, 119, 135, 191, 209.
Health, 202.
History, 22, 26, 101.
Horticulture, 14, 79.
Knowledge, 1, 36, 39, 93, 124.
Icthyology, 141.
Licks and Caves, 27, 74, 100.
Meteorology, 11, 205.
Mexican History, 51, 128.
Mineralogy, 61, 140.
Navigation, 202.
New Animals, 21, 61 to 65.
New Plants, shrubs and trees, 16, 78, 146, 144, 150, 170 to 182.
New Reptiles, 22, 63, 64, 121, 143.
New Shells, 121, 154, 165.
Orography or Mountains, 77, 101, 105.
Oryctography or new fossils, 67 to 74, 109, 116, 122, 142, 143.
Peruvian Dynasties, 130.
Philology and Vocabularies, 4, 40, 44, 48, 112, 132, 173, 198.
Philosophy, 48, 95.
Physical Geography, 137, 188, 209.
Reviews, 34, 82, 110, 114, 122.
Travellers, 26, 77, 85, 155, 187, 211.
Volcanoes, 137, 201.
Zoology, 18, 61 to 65, 121, 143, 163, 165, 175.

291

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WITH NUMEROUS FIGURES.

EDITOR, C. S. RAFINESQUE,
Professor of Historical and Natural Sciences, &c.

VOL. I. PHILADELPHIA, SPRING OF 1832. No. 1.

Knowledge is the mental food of man.

INTRODUCTION.

PERIODICALS abound in the United States; but those calculated to improve and instruct, to scatter the seeds of learning, and become eminently useful by rendering all kind of knowledge and improvements popular, are as yet but few and costly; thus beyond the means of those whom they are most likely to benefit. It is such a deficiency that this journal is partly intended to supply.

It is contemplated therefore to publish, in the city of Philadelphia, a new periodical journal under the above title. It will be conducted by Prof. RAFINESQUE, assisted by several gentlemen of considerable talent and knowledge.

This journal shall contain every thing calculated to enlighten, instruct, and improve the mind. It will not be confined to any particular branch of literature and science, but embrace by turns every subject useful or interesting. Agriculture and economy, with discoveries in the useful arts and practical sciences, will claim peculiar attention. Literature shall not be forgotten; it is also a branch of knowledge, but facts shall have the preference over fiction. Reviews will be introduced on the new plan of stating the increase of knowledge afforded by books. The whole is intended to be original matter; selections shall seldom be resorted to.

This journal is ventured without any pretensions, and none of the usual pompous promises. It will be of a strikingly novel character, and must be left to speak for itself; to deserve by its own intrinsic value and merit the patronage which it claims from all the friends of knowledge, education and learning.

The Editor being always in pursuit of knowledge, will be able to furnish most of the articles, when not proffered by his collaborators. The subscription is limited to ONE DOLLAR per annum, or TWO DOLLARS for each volume of twelve numbers, or four hundred pages, title-page, index, and nearly fifty figures. This periodical is begun in a quarterly form, but it is hoped may soon become a monthly journal.

Communications for this Journal, may be left at the post office or sent by mail, postage paid. None will be calculated for this paper unless very terse and concise, either useful or novel in character or purpose: new facts will be acceptable above all. Anonymous papers or Reviews will very seldom be accepted. Every writer ought never to be ashamed of his pen and deeds. The initials of C. S. R. will designate the editorial articles.

1. LATENT KNOWLEDGE.

Besides the actual active knowledge of mankind, formed by the accumulation of exertions in all the branches of human acquirements; and spread in the numberless books

on education, the arts and sciences, history and literature: there is another mass of knowledge, which may be called latent or sleeping. The amount of it is much greater than could be supposed. There are in all the branches of knowledge, some portions nearly forgotten and lost, which gradually sink into oblivion and are lost to mankind; like the immense amount of facts, events and practices, which have thus become extinct during the lapse of ages.

If all the extinct knowledge was yet existing, it might exceed perhaps what is now extant, although we deem it prodigious. Every friend of learning has to regret the loss of some past knowledge, of which faint indications or small fragments merely remain. But if the latent knowledge be added, as it is eventually by the neglect of ignorance, the whole of this dormant or forgotten, together with the dead or lost, both of which are now rendered useless to mankind, will be found prodigious.

But fortunately the latent or dormant may yet be restored and rendered available, by care, patient researches and exertions. It is to be found scattered in old books, or even new publications of limited circulation, in manuscripts, in the memory of men, in monuments that speak a peculiar language to be learnt and restored. All this among us. But further off, we have in the literature and books of Asia from Persia to India, China and Japan, an inexhaustible mine of learning, hardly explored as yet. The Asiatic nations, were the first teachers of mankind; their western children who boast of having surpassed them in every thing, have neglected their old teachers for ages; but now begin to interrogate them again.

Our attention shall often be drawn towards this subject. It is deplorable to see the servility, laziness and ignorance of many of our popular writers on all subjects. They will not take the trouble to enquire; they bow to some idols of yore, and copy or compile from them without discernment nor careful investigation of previous labours by other men or nations. We can hardly open a work of history, travel, or science, without meeting thousand instances of neglect and ignorance. All our books of education are sadly deficient, except on those matters lately investigated. Facts, events and discoveries without number are set aside, not attended to, or even not known. To this shameful practice, which threatens a true Vandalic destruction of knowledge, we mean to draw the attention of the public, and expose it in all its turpitude and injurious bearings. C. S. R.

2. PUBLIC INSTRUCTION.

Free Institutions of Paris and France.

The following concise account of those Institutions, and their wonderful effect upon the French people, is not derived from any doubtful source or formal friend; but chiefly from the pen of Sir Arthur Faulkner, an Englishman, who visited France in 1827 for the purpose of investigating the subject of such free Institutions: and from an analytical abridgement of the work published by him on his return. They are obvious and luminous facts, speaking volumes in favour of free Education.

The total number of general schools in Paris was 647 in 1827, having 60,000 scholars. They were chiefly 294 Infant schools, all gratis, teaching reading, writing, and arithmetic, and elements of drawing.

53 primary schools for boys.
51 ditto for girls.
22 Sunday schools.
12 Schools of mutual Instruction for boys.
5 ditto for girls.
100 Boarding schools for boys.
110 ditto for girls.

Besides innumerable peculiar schools of Drawing, Painting, Ar-

chitecture, Masonry, Carpentry, Music, Languages, Mathematics, and all the sciences.

The schools are all free and gratuitous, except the Boarding schools. The girls are taught sewing, handy-work, embroidery, and all the trades suitable and befitting females to earn a living!

There are also schools for the unfortunate, for the blind, the lame, the cripples, the deformed, all of which are taught trades suitable to their state, and enabling them to earn their living by useful labor.

There are 34 public libraries in Paris, all free to every one, open and accessible every day, with polite librarians and servants to help readers. The largest, or the royal library, contains 500,000 volumes! the next 170,000, the third 93,000. The library of the Institute has 70,000 volumes, the city library 42,000; the other from 2000 to 30,000. French books are printed and sold at one-third of the price of English books, with a rapidity beyond belief, and thus circulated all over Europe. Old books and second-hand books are sold for a mere trifle in the streets by 1000 pedlars, or on benches.

The public garden and museum, are the Emporium and palace of natural sciences. Open and free to every one; in the garden, agriculture and gardening are taught gratis, and seeds given to all who apply. All the natural sciences are taught by free lectures and demonstrations to whoever attends.

The Louvre, or palace of fine arts, is opened to the public every day, even Sundays, and crowded by visitors.

Fifty other Institutions have peculiar Cabinets, Museums, Galleries, with free admittance and free lectures; in all the medical sciences, History and Literature, Mining, Engineering, &c.

No fees are taken by Professors and Assistants, for teaching, demonstrating and waiting on visitors. No present is allowed, much less exacted as in England by servants and underlings.

The same happens all over France. Free schools are scattered over the whole country, and free Institutions, Libraries, Museums, Gardens, Lyceums, &c., in all the principal towns and cities. Lectures on Farming are given by practical farmers, on trades by mechanics.

The expenses of these free Institutions are borne by the state, the cities, or foundations for the purpose; but chiefly paid out of the public expense, under the title of Public Instruction. The most useful, and most honourable mode of spending public money.

Consequences.

The happy results of this state of things, are that the French are become a great people, at the head of civilized Europe, and withal a moral people! much better off and more moral than the English. The former idle gallantry and vicious courses are become quite uncommon. The French peasantry are industrious, frugal, orderly, kind, cheerful and contented. There are no paupers as in England. A few beggars only are licensed under peculiar circumstances, if unlicensed they are taken up as vagabonds. Vices and crimes are much less in number and atrocity than in England. Wine sells every where for one to three cents the bottle, yet intoxication is hardly known. No brandy, and no alcoholic liquors are drunk to poison and brutalize the body and mind.

Sir A. Faulkner exclaims in despair: "England is famous for charities to the helpless, but neglects to prepare the people to help themselves. When we reflect on the peculiar facilities of access to books, lectures, museums, cabinets, &c. in Paris and all over France, *gratis to all*, we have a ready solution why the French community at large are so much advanced in civilization and refinement, before any other

country in the world!" This confession comes from an Englishman.

In the United States, we imitate, as yet, England in almost every thing, good or bad. Thus we can hardly believe that it is possible to have Free Institutions, Colleges, Lectures, Libraries, Museums, &c. without paying at least a fee of 25 cents each time we visit them, or an annual subscription. And thus we have intemperance, immorality, paupers, ignorance—with all their baneful consequences. What ought to be done, and what free Institutions are immediately required to foster, preserve and secure, the future liberties and morals of our people, will be indicated at a future time. Public Instruction or the acquirement of knowledge, by all young and old, unlimited and without cost, must be the principal means of future national happiness.

BENJ. FRANKLIN, JR.

3. PHILOLOGY.

First Letter to Mr. CHAMPOLION, *on the Graphic systems of America, and the Glyphs of* OTOLUM *or* PALENQUE, *in Central America.*

You have become celebrated by decyphering, at last, the glyphs and characters of the ancient Egyptians, which all your learned predecessors had deemed a riddle, and pronounced impossible to read. You first announced your discovery in a letter. I am going to follow your footsteps on another continent, and a theme equally obscure; to none but yourself can I address with more propriety, letters on a subject so much alike in purpose and importance, and so similar to your own labours.

I shall not enter at present into any very elaborate discussion. I shall merely detail in a concise manner, the object and result of my inquiries, so as to assert my claim to a discovery of some importance in a philological and historical point of view; which was announced as early as 1828 in some journals, (3 letters to Mr. M'Culloh on the American nations,) but not properly illustrated. Their full development would require a volume, like that of yours on the Egyptian antiquities, and may follow this perhaps at some future time.

It may be needful to prefix the following principles as guides to my researches, or results of my inquiries.

1. America has been the land of false systems; all those made in Europe on it are more or less vain and erroneous.

2. The Americans were equal in antiquity, civilization, and sciences to the nations of Africa and Europe; like them the children of the Asiatic nations.

3. It is false that no American nations had systems of writing, glyphs, and letters. Several had various modes of perpetuating ideas.

4. There were several such graphic systems in America to express ideas; all of which find equivalents in the east continent.

5. They may be ranged in twelve series, proceeding from the most simple to the most complex.

1*st Series.*—Pictured symbols or glyphs of the Toltecas, Aztecas, Huaztecas, Skeres, Panos, &c. Similar to the first symbols of the Chinese, invented by Tien-hoang before the flood, and earliest Egyptian glyphs.

2*d Series.*—Outlines of figures or abridged symbols and glyphs, expressing words or ideas; used by almost all the nations of North and South America, even the most rude. Similar to the second kind of Egyptian symbols, and the Tortoise letters brought to China by the *Long-ma* (dragon and horse) nation of barbarous horsemen, under *Sui-gin*.

3*d Series.*—Quipos or knots on strings used by the Peruvians and several other South American nations. Similar to the third kind of Chinese glyphs introduced under *Yong-ching*, and used also by many nations of Africa.

4*th Series.*—Wampums or strings

of shells and beads, used by many nations of North America. Similar to those used by some ancient or rude nations in all the parts of the world, as tokens of ideas.

5th Series.—Runic glyphs or marks and notches on twigs or lines, used by several nations of North America. Consimilar to the runic glyphs of the Celtic and Teutonic nations.

6th Series.—Runic marks and dots or graphic symbols, not on strings nor lines, but in rows; expressing words or ideas; used by the ancient nations of North America and Mexico, the Talegas, Aztecas, Natchez, Powhatans, Tuscaroras, &c. and also the Muhizcas of South America. Similar to the ancient symbols of the Etruscans, Egyptians, Celts, &c. and the *Ho-tu* of the Chinese, invented by *Tsang-hie;* called also the *Ko-teu-chu* letters, which were in use in China till 827 before our era.

7th Series.—Alphabetical symbols, expressing syllables or sounds; not words, but grouped; and the groups disposed in rows; such is the graphic system of the monuments of Otolum, near Palenque, the American Thebes. Consimilar to the groups of alphabetical symbols used by the ancient Lybians, Egyptians, Persians, and also the last graphic system of the Chinese, called *Ventze*, invented by *Sse-hoang.*

8th Series.—Cursive symbols in groups, and the groups in parallel rows, derived from the last, (which are chiefly monumental,) and used in the manuscripts of the Mayans, Guatimalans, &c. Consimilar to the actual cursive Chinese, some demotic Egyptian and many modifications of ancient graphic alphabets, grouping the letters or syllables.

9th Series.—Syllabic letters expressing syllables, not simple sounds, and disposed in rows. Such is the late syllabic alphabet of the Cherokis, and many graphic inscriptions found in North and South America. Similar to the syllabic alphabets of Asia, Africa, and Polynesia.

10th Series.—Alphabets or graphic letters expressing simple sounds, and disposed in rows. Found in many inscriptions, medals, and coins in North and South America, and lately introduced every where by the European colonists. Similar to the alphabets of Asia, Africa, and Europe.

11th Series.—Abreviations or letters standing for whole words, or part of a glyph and graphic delineation, standing and expressing the whole. Used by almost all the writing nations of North and South America, as well as Asia, Europe, and Africa.

12th Series.—Numeric system of graphic signs, to express numbers. All the various kinds of signs, such as dots, lines, strokes, circles, glyphs, letters, &c. used by some nations of North and South America, as well as in the eastern continent.

In my next letter I shall chiefly illustrate the 7th and 8th series, so as to decypher and explain one of the most curious and least known of the American modes of expressing and perpetuating ideas. I shall give a figure of a sample of those monumental symbols, with comparative figures of two alphabets of Africa, the nearest related to them, and where the elements may be traced, which are grouped in those glyphs.

Some years ago, the Society of Geography, of Paris, offered a large premium for a voyage to Guatimala, and a new survey of the antiquities of Yucatan and Chiapa, chiefly those fifteen miles from Palenque, which are wrongly called by that name. I have restored to them the true name of Otolum, which is yet the name of the stream running through the ruins. I should have been inclined to undertake this voyage and exploration myself, if the civil discords of the country did not forbid it. My attention was drawn forcibly to this subject as soon as the account of

those ruins, surveyed by Capt. Del Rio as early as 1787, but withheld from the public eye by Spain, was published in 1822 in English.

This account, which partly describes the ruins of a stone city 75 miles in circuit, (length 32 English miles, greatest breadth 12 miles,) full of palaces, monuments, statues, and inscriptions; one of the earliest seats of American civilization, about equal to Thebes of Egypt; was well calculated to inspire me with hopes that they would throw a great light over American history, when more properly examined.

I have been disappointed in finding that no traveller has dared to penetrate again to that recondite place, and illustrate all the ruins, monuments, with the languages yet spoken all around. The society of Geography has received many additional accounts derived from documents preserved in Mexico; but they have not been deemed worthy of the reward offered for a new survey, and have not even been published. The same has happened with Tiahuanaco in Bolivia and S. America, another mass of ancient ruins and mine of historical knowledge, which no late traveller has visited nor described.

Being therefore without hope of any speedy accession to our knowledge of those places, I have been compelled to work upon the materials now extant, which have happily enabled me to do a great deal, notwithstanding all their defects, and throw some light on that part of the history of America.

C. S. Rafinesque,

Philadelphia, January, 1832.

4. AMERICAN HISTORY.

Tabular View of the American Generic Languages, and Original Nations.

One of the most glaring errors of speculative philosophers on the subject of America, is to be found in their assertion that American languages and nations are multiplied beyond conception, and cannot be reduced to order. This misconception arose from a superficial knowledge of the matter, and a wish to assert extraordinary things. If the same wish had been evinced respecting Europe, they could have found 60 languages and nations in France, and 100 in Italy, by considering the various provincial French and Italian Dialects, as so many languages, since many of them cannot be understood by the respective provincials of the same country. And each provincial group would be a nation, since languages distinguish nations.

Even Balbi, after reducing the 1500 or 1800 supposed American languages and tribes to 422, has not attempted to class them except geographically. I made the attempt ever since 1824 in the Cincinnati Literary Gazette, and have since corrected my classification, reducing the 1800 American Dialects to about 25 Generic languages, which belong to the original nations of America, many of which have yet as much affinity as the Latin and Greek, or English and German.

They are the following, 14 from North and 11 from South America.

1. *Languages and Nations of North America.*

1. Uskih, divided into about 30 Dialects and tribes; such as Esquimaux, Mœuts, Chugach, Aleutian, Chuchi, &c. spoken all over Boreal America, from Bering strait and Alaska to Labrador and Groenland.

2. Onguy, about 50 dialects and tribes; Huron, Onondaga, Seneca, Hochelaga, Tuscorora, Notoway, &c. extending from the Pacific ocean to Canada and Carolina.

3. Lenap, nearly 250 dialects and tribes; such as Chinuc, Dinneh, Algic, Shawan, Miami, Micmac, Mohegan, Nantico, Powhatan, &c. extending from the Columbia river on the Pacific ocean to Hudson bay, New England and Florida.

4. Wacash, about 60 dialects and tribes; Atnah, Chopunish,

Coluch, Chingita, &c. spoken from California to latitude 55 in the north west coast of America.

5. Skeeeh, above 125 dialects and tribes; Panis, Seris, Pakis, Lepan, Shoshoni, Opata, Uchis, Poyay, &c. extending from Slave lake to California, Texas, Florida, and Honduras.

6. Nacherz, nearly 75 dialects and tribes; Cado, Yatasih, Wocon, Cuza, Cataba, &c. extending from Sinaloa in the West to Carolina in the East.

7. Capaha, about 50 dialects and tribes; Washasha, Yatani, Oto, Ochagra, Dacota, &c. extending from the head of Missouri river to the Wabash and Arkanzas rivers.

8. Chactah, above 40 dialects and tribes; Chicasa, Yazu, Coroa, Humah, Muskolgih, Seminole, &c. extending from Texas to Florida.

9. Otaly, about 25 dialects and tribes; Tsuluki or Cherokees, Tallegha, Talahuicas, Talahasi, &c. extending from the Alleghany mountains to the mountains of Mexico.

10. Atalan, about 25 dialects and tribes; Tala or Tarasca, Matalan, Tulan, Tecas, Tolban, Colima, Tarahumara, &c. extending from New Mexico to Michuacan, and Nicaragua.

11. Otomi, about 20 dialects and tribes; Miges, Dotami, Mazahuy, &c. extending from Arkanzas to Mexico.

12. Aztec, about 20 dialects and tribes; Tolteca, Olmeca, Cora, Pipil, &c. extending from Mexico to Nicaragua.

13. Maya, about 40 dialects and tribes; Huazteca, Poconchi, Guichi, &c. extending from Texas, to Yucatan and Guatimala.

14. Chontal, about 50 dialects and tribes; Tzendal, Choles, Locas, Lencas, Zoques, Quelen, Chiapan, &c. extending from Chiapa to Panama.

2. *Languages and Nations of South America.*

15. Aruac, having nealy 100 dialects and tribes; such as Haytian, Cuban, Yucayan, Eyeri, Cairi, Arara, Cumana, Arayas, Aragoas, &c. extending from the islands of Bahama and Cuba, to Coro, Cumana, Guyana and Brazil.

16. Calina, about 122 dialects and tribes; Carib, Galibi, Yaoy, Tamanac, Guarivas, Gotos, Chaymas, Gutacas, &c. spread from the Carib islands to Darien, Oronoco, Guyana and Brazil.

17. Puris, about 90 dialects and tribes; Maypuris, Achaguas, Coropos, Camacan, Parexis, Parias, &c. extending from Paria and the Oronoco to Brazil and Paraguay.

18. Yarura, about 25 dialects and tribes; Betoy, Ayrico, Ele, Yaros, Charua, Ozomaca, Gauna, &c. spread from the river Oronoco to the river Parana and Popayan.

19. Cuna, about 25 dialects and tribes; such as Uraba, Darien, Cunacuna, Choco, Cocinas, &c. spread from Panama to Coro and Popayan.

20. Mayna, about 60 dialects and tribes; Yameos, Amaonos, Manoa, Cauchas, Panos, Managua, Solimos, Aguanos, &c. spread from Popayan and Quito to the Maranon and Parana.

21. Maca, about 100 dialects and tribes; Muhizca, Yuncas, Zamuca, Pancha, Moxos, Otomacas, Tao, Pinoco, Chaco, &c. spreading throughout South America from Cundinamarca to Peru and Brazil.

22. Guarani, nearly 300 dialects and tribes; Tupi, Omagua, Cocama, Guyana, Payagua, &c. spread throughout Brazil, and from the Andes to the Atlantic sea, as far south as Buenos Ayres.

23. Maran, about 50 dialects and tribes; Quichua, Aymaru, Muras, Marahas, Andoa, Moratas, Zapibo, Cuyaba, &c. spread from Peru in the west to Brazil in the east on both sides the Equator.

24. Lule, about 25 dialects and tribes; Vilela, Mocobi, Abipon, Toba, Atalala, &c. spread through Chaco, Tucuman and Paraguay.

25. Chili, about 20 dialects and

tribes; Puelche, Chonos, Araucan, Tehuelet, Yacanac, Kemenet, &c. spread all over Austral America from Chili to Magelania and Fuego islands.

Even these 25 Languages and Original Nations may perhaps be reduced to 18 by more accurate investigation; thus the 4th and 5th may become united; as well as 6 and 8, 7 and 11, 9 and 10, as they have considerable analogies. The same may happen in South America with 15, 16 and 19, also with 17, 18 and 20, which approximate by gradual dialects. C. S. RAFINESQUE.

July 4th, 1829.

Remark.—The above was published in the Evening Post; it is now reprinted because it is the key to American Ethnology, Philology and History! The proofs would fill volumes. It is results that analytical Sciences chiefly require. The wide extent of Nations 1, 2, 3, 12, 15, 16, 22, were already acknowledged: the others depend on my researches, and are open yet to many improvements, nay, I have effected some since 1829.

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5. THE ATLANTIC *Nations of America.* By C. S. RAFINESQUE.

The Ocean separating Europe and Africa from America is yet called the Atlantic ocean, our litoral states are called the Atlantic states. The Atlantes of North Africa who gave their name to the Atlas mountains, and whose descendants exist there as yet under the names of Tuarics, Berbers, Shelluh, Showiah, &c. were one of the primitive nation of both continents. They came to America soon after the flood, if not before, colonised and named the Ocean and the islands in it, as well as America, which was called the GREAT ATLANTIS, or rather ATALA, meaning the *first or main land.* This name is preserved in Hindu traditions. The Atlantes were not the only primitive colonists of America; but they were the most conspicuous and civilized. Their true name was Atalans. They may have been the founders of OTOLUM and many other ancient cities. Their descendants *exist to this day* in America, under the names of Talas or Tarascas, Atalalas, Matalans, Talegawis, Otalis or Tsulukis, Talahuicas, Chontalas or Tsendalas, &c. from Carolina to Guatimala.

When Columbus discovered again America, he and the earliest explorers were struck with the similarity between many American tribes, and the Guanches of the Canary islands, remains of the Oceanic Atlantes, in features, manners and speech. Whether the Haytians, Cubans, and Aruacs were genuine Atlantes is rather doubtful, because their language is more akin to the Pelagic than the Atlantic. But three at least out of the twenty-five original nations of America above enumerated may safely be deemed children of the Atlantes. They are the ninth or Otalis, the tenth or Atalans, and the fourteenth or Chontals.

This could be proved in many ways, and by their languages compared with those of their African brethren, Tuarics, Guanches, &c. after a separation of nearly 5000 years. But the proofs would fill a volume.

Our actual Cherokis and akin tribes are the children of the first branch, named Otalis. This was their original name. Adair only 100 years ago says that the genuine or upland Cherokis were called Otalis, which name meant mountaineers as in Africa. They call themselves now Tsulukis. Our name of Cherokis is derived from the word Chelakis, name of a tribe. They have not the sound of R in their speech. Only one tribe substitutes R to L. The interesting history of this nation shall deserve our attention hereafter. The Chontal branch or nation will come under notice in investigating the antiquities of Otolum

or Palenque. It remains here to survey the genuine branch of ATALANS, eldest perhaps of the American Atlantes.

Among this, the best known (and yet hardly known) are the Tarascas of Michuacan in West Mexico: the brave nation that first asserted the late Mexican Independence. Their true name is TALA, and TALA, S, CA, meaning *Tala, self, the,* or in our idiom *the veryself Tala.* They have no R in their speech, and this name was changed by the Othomis and Mexicans into TARASCAS. See grammar of their language by Basalenque, Mexico, 1714.

From this interesting little work, some other account from Vater, and the Spanish writers we learn something of their language which is yet spoken and may be thoroughly studied. We also learn that they formed a powerful and civilized kingdom independent of Mexico at the Spanish Invasion, which became the ally of the Spaniards; but was by them, subdued by treachery and infamous conduct. But we learn very little of their previous history: and the little known is buried in untranslated Spanish books. It is by their language that we can hope to trace their origin and most remote history. *Languages do not lie,* says Horne Tooke. They reveal what time has buried in oblivion.

We shall therefore give some account of it, that the learned or curious may study its affinities. So far as we have done so already, we have been struck with its evident analogy with the Atlantic, Coptic, Pelagic, Greek, Latin, and Italian languages of Africa and Europe, both in words and structure, in spite of a separation of four or five thousand years.

This language is rich, beautiful, and highly complex. It amalgamates particles to modify the words, as in Italian. The verbs have fifteen modifications, as in Italian, or nearly so; they can be compounded as in Greek. It admits of all the Greek rhetorical figures. The plural is formed by X. It has nearly all the European vocal sounds except F and R; also no GN and no LL; but it has three sibilant TS, TZ, and TZH.

The analogies with the Italian are striking in the following phrases, and some even appear with the Saxon English.

English.	*Tala.*	*Italian.*
1. Thou	Thu	Tu
2. Was (wast)	Esca	Sei (fosti)
3. Thou who	Thuqui	Tu che
4. Spoke	Vandahaca	Favelasti
1. I	Hi	Io
2. Was	Esca	Sei (fui)
3. I who	Hiquinini	Io che
4. Loved	Pampzahaca	Amai
1. Is not	Noxas	Non E
2. So wise	Mimixcti	Amico (savio)
3. As I	Isqui hi	Com'io

The following vocabulary of 85 words, gives a fair sample of the language. The affinities with the Pelagic and its children, Greek, Latin, Etruscan, and Italian, are marked by the letter P; those with the Atlantic dialects of Africa, with the letter A. They amount to 50 out of 85 with the Pelagic, or 60 per cent. of analogy; and to 33 out of 65 with the Atlantic, or 51 per cent. These are striking facts, deserving attention, in spite of the unbelief of some ignorant or lazy philosophers or historians, who neglect or disbelieve these evident proofs. The sixteen English affinities are marked by an asterisk. The orthography is, of course, Spanish.

English.	*Tala.*
Water	Ama, Ma. A. P.
Fire	Pa, Vepo, Tani. A. P.
*Land	Haca, Eche, Andatze. A. P.
Stone	Tzacapu, Zampsin. A. P.
Men	Cuiri. A.
	Puecha. P.
	Marin. P.
Dog	Vichu. A.
*Mountain	Vata. A.

English.	*Tula.*
Star	Hosqua.
Day	Vina. P.
Night	Ahchiuri, Tzire.
*Heaven	Parini, Avandu. A. P.
*House	O, Chao. P. A.
*Father	Tata. A. P.
Mother	Nana. P.
Hand, Arm	Cu, Xu. A.
Foot	Du. A.
Head	Tsi. P.
*Mouth	Mu. A. P.
Beard	Hapu. P.
End, Tail	Yara. P.
One	Mah.
Alone	Mahco.
Ten	Xam. P.
Much	Cani. A.
*Priest	Amberi. P.
	Quinametin.
God	Tucapacha. A.
Just	Casipeti.
Good	Ambaqueti.
Wise, Friend	Mimi. P. A.
Little	Caxeti.
Tree	Emba, Ches. A. P.
Bark	Chucari. P.
Leaf	Xahcuri.
Bread	Curinda. A.
*Colour	Chara. P.
Plain	Pe. P.
Sand	Cutza.
Peak	Phurequa. P.
Evil	Sismaraqui, Himbo.
Boat	Xu. A.
*Self	S. (P.
*I, Me	Hi. (P. A.
Myself	His. (P. A.
*Thou	Thu. (P.
Thine	Thuicheveri.
You	Thucha.
Yours	Thuchaveri.
We	Hucha.
Ours	Huchaveri.
This	I. (P.
These	Ix.
That	Inde, Ima.
Mine, Own	Huchevi.
Be	E. (A. P.
To be	Eni. A. P.
I am	Ehaca. A. P.
*Is	Esti. A. P.
Was	Esca. A. P.
*Place, Earth	Can, Haca. A. P.
King	Irecha. A. P.

English.	*Tula.*
Kingdom	Arikeve. P.
Name	Acan, Guriqua.
Fish	Mechoa. P.
*City	Fatziza. P.
Deer	Taximaroa.
Festival	Metotes, P.
To give	Inspeni.
To write	Carani. P.
To say	Harani. P.
To hold	Uhcamani.
To wash	Hopo.
To think	Haugue. P.
To take	Piran. P.
To come	Hurani. P.
	Tirovi.
Food	Caro, Aqua. P. A.
Drink	Itsima. A.
Handsome	Tzitzis. A.
Living	Tzipeti. P.
To live	Tzipeni.
Singer	Pireti. P.
To sing	Pireni.
*Not	Noxas. P. A.
*Like, As	Isqui. P.
Love	Pampza. P.
Speech	Vanda. P.
Who, Whom	Qui. P.
The	Ca.

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6. *William Penn's Deed from the Indians in* 1685.

This indenture witnesseth, that —We, Parkenab, Jarckan, Sikals, Partquesott, Jervis Essepenank, Felktroy, Hekellappan Econus, Machlola, Metthconga, Wissan Powey, Indian Kings, Sachemakers, right owners of all lands, from Quing Quingan, called Duck creek, unto Upland called Chester creek, all along by the west side of Delaware river, and so between the same creek backwards as far as a man can run in two days with a horse, for and in consideration of these following goods to us in hand paid, and secured to be paid by William Penn, proprietary and governor of the province of Pennsylvania and territories thereof, viz: 20 guns, 20 fathoms match coat, 20 fathoms of strong water, 20 blankets, 20 kettles, 20 pounds powder, 100 bars of lead, 40 tomahawks, 100 knives, 40

pair of stockings, 1 barrel of beer, 20 pounds of red lead, 100 fathoms of wampum, 30 glass bottles, 30 pewter spoons, 100 awl blades, 300 tobacco pipes, 100 hands of tobacco, 20 tobacco tongs, 20 steels, 300 flints, 30 pair of scissars, 30 combs, 60 looking glasses, 200 needles, 1 skipple of salt, 30 pounds of sugar, 5 gallons of molasses, 20 tobacco boxes, 100 Jews harps, 20 hoes, 20 gimblets, 30 wooden screw boxes, 100 string of beads—Do hereby acknowledge, &c. Given under our hands, &c. at New-Castle, 2d day of the Eighth month, 1685.

The above is a true copy taken from the original by Ephraim Morton, now living in Washington county, Pennsylvania, formerly a clerk in the land office, which copy he gave to Wm. Hutton, and from which the above is taken in Little York, this 7th of December, 1813.

Remarks.—The above deed copied from the Ephemeral Press, is not yet recorded in history; but deserves to be. It was the first instance of a colonist having bought a country from an European king, who had no more right to it than the king of the moon, buying again from the real owners of it. It is the first title deed of the great state of Pennsylvania. Yet the good W. Penn did not pay the full value to the 10 ignorant Indian Chiefs, and his example has been closely followed to this day. He bought by that deed about 2000 square miles of good land for about $300, which is now worth as many millions, and was then worth at least $10 the square mile instead of 15 cents paid for it.

Yet this deed is not explicit enough, at least as it was printed, because it does not state how much land was ceded and sold, unless they sold their whole domain from the Delaware to the Susquehannah between Duck creek and Chester creek, and the sale be implied by the &c. &c., or not printed. We doubt whether this deed would be good in a court of law or equity. It is chiefly curious by the enumeration of the articles given, some useful and some useless, like the Jews harps. We strongly suspect that this deed alludes merely to the first presents made by the worthy W. Penn to procure the good will of the Indians, and has since been construed into a sale of the whole territory of these Lenap Indians, of whom Parkenab must have been the great sachem. It is well known that at a second treaty held at Shackamaxon, now Kensington, another friendly alliance (or sale) was made. The subsequent history of Pennsylvania after Penn, affords many instances of injustice to the friendly Lenaps.

7. METEOROLOGY.

Climate of Rochester in New York, chiefly based upon the observations and tables of the Genesee Farmer for 1831.

Rochester is the most thriving town in the western part of the great state of New York. It is situated at the intersection of the Genesee River and Great Erie Canal, near the falls of the Genesee and not far from Lake Ontario, towards latitude 43.

The extremes of temperature were 95 degrees on the 3d June, and 4 below 0 on the 7th February. Difference 99 degrees, medium 45½ degrees. The highest medium was in September 61 degrees, the lowest December 10 degrees. The mean atmospheric pressure was 29 degrees 51 minutes.

The number of rainy days were 115, and 27 inches of rain fell, in July alone 5 inches. As many as 66 snowy days were noted with 76 inches of snow fallen, in all the months of the year except June, July, August, and September. The prevailing winds west, south-west, north-west. It is noticed that the temperature of spring water varies from 40 to 60 degrees, medium therefore 50 degrees.

This mean heat of 50 degrees in springs and range of 99 degrees, is an additional proof that the interior of this continent is warmer than the coast and has a lesser range of variation, an usual concomitant effect. Since Portsmouth in New Hampshire on the Atlantic ocean and the same parallel of 43 degrees as Rochester, has a mean temperature of 44 and range of 110. While Detroit in Michigan, still farther west and also near 43 degrees, has 50½ mean heat, with a range of 116. It must be added that Rochester and Detroit are both much above the level of the ocean and ought therefore to be colder on a par.

Parallel of 43 degrees latitude.

1. Portsmouth, level of the sea, 44 degrees mean heat, range of 110 degrees.

2. Rochester, 480 feet above the sea, 45½ mean heat of the air, 50 of the springs, range 99.

3. Detroit, 565 feet above the sea, 50½ mean heat, range 116? is this right?

It is probable that the increase of mean heat and smaller range, is gradual all the way from the Atlantic to the Pacific ocean; where a difference of 12 degrees at least in equivalent temperature and range is found. There the 52 degree of latitude being equal to the 40 degree, near Philadelphia or as warm. The 52 degrees of Europe is also equal to the 40 in China, the eastern part of each continent being colder.

But the different years often give variable results: thus this year, 1832, the winter has been very severe all over North America. The river Delaware was frozen at Philadelphia from the beginning of December to the middle of February, which had not happened for nearly 40 years. In Rochester it is stated that the winter has been more severe than for 20 years past in the Genesee country. By comparative observations made at Albany and Rochester in December last, at sunrise, there has been found a great difference of many degrees of warmth in favour of Rochester, although it is 480 feet above the sea, lat. 43 10, and Albany at tide water in lat. 42 35.

1831.	Albany.	Rochester.	Diff.
Dec. 8th	3° bel. 0	16° ab. 0	19°
9th	2° do.	18° do.	20°
10th	8° do.	14° do.	22°

This is an additional complete proof that the climate improves inland.

The Genesee Country of which Rochester is the metropolis, extends from Pennsylvania or lat. 42, to Lake Ontario in lat. 43½. It contains about 4000 square miles of fruitful soil. The staples are wheat, averaging 20 bushels to the acre, and maize averaging 40 bushels. The mean heat of the vegetating season is 60 degrees.

8. AGRICULTURE.

Results of the Experiments of Recluz *on the Fixed Oils.*

This article is one of those of practical Sciences, which belong at once to many, being connected with Agriculture, Gardening, Chemistry, Economy and Materia medica; this enhances their value.

Fixed Oils of Vegetables are of the utmost importance and use for food, light, cooking, soap, machinery, manufactures, and medicines. It was very needful to ascertain exactly what quantity was afforded by each vegetable, so as to know the most profitable to cultivate, and cheapest to use; this has been done by Recluz, a French chemist, and we give here the analysis of his labours.

All the experiments were made upon one pound of the substance, or 7680 grains weight, and the quantity of oil afforded is stated in ounces.

Almonds 7½ ounces.

Hemp seed 3½ ounces.

Cocos 4 ounces.

Olives 3¼ ounces, specific weight 0915, forms solid soap.

Poppy seed 4 oz. specific weight 0922 forms liquid soap.

Arachis or groundnut 8 ounces, fine eatable oil, citron colour, keeps well and makes good soap.

Sesamum or Benny seed 3½ oz. fine sweet oil, limpid and nutrient, but becomes easily rancid.

Pumpkin seed 5¼ ounces, sweet oil, not siccative.

Cornus berries, 4 ounces.

Moringa, or Ben oil, 6 oz. white, concrete, made by heat, smells like noyau.

Euphorbia lathyrus seeds, 8 ounces by ether, 7 by cold expression; medical purgative.

Croton tiglium seeds 9 ounces, green, drastic.

Helianthus or Sunflower 6 oz. sapid sweet oil.

Cyperus esculentus roots 3 oz.

Datura seeds 2½ ounces, medical.

Grape seeds 1½ ounces, by boiling.

Ricinus or Castor oil, 5 to 6 ounces made cold, 7 ounces warm, 12 ounces with shelled seeds.

Sassafras seeds 2½ ounces white oil, medical.

Beech nuts 6 to 7 ounces, sweet, clear, inodorous; gets better by age to the reverse of other oils.

Xanthium or Burr seed, 4½ ounces, sweet oil; gives a fine clear light.

Flax seed 3½ ounces, yellow brown, siccative, fetid.

Walnuts 8 ounces, lemon colour oil, thick, siccative, makes a soft soap, gives 12 ounces when nuts dried in ovens.

Pine seeds (Pinus pinea, P. cembra) 5 oz. sweet oil of good flavour, good to eat.

Almonds of stone fruits, plumbs, peaches, &c. 3 ounces.

Mustard seeds 3½ oz. yellow, sweet, odorous, good soap.

Laurus or Baytree berries 7½ ounces green oil, the seeds 1½ ounces of concrete greenish oil.

Hazlenuts 7½ ounces, sweet thin lemon oil.

Thus it will appear that in the United States we might make an immense quantity of oils, from the most oily substances common with us. Groundnuts, pumpkin seeds, sunflower seeds, hazlenuts, walnuts, beechnuts, &c. for all the needful purposes of salads, cooking, burning in lamps, soap making, &c. if industry was not palsied by ignorance.

Mr. Recluz has omitted the cotton seeds, which afford nearly 50 per cent. of good burning oil, and 80 per cent. when shelled. We might make millions of gallons of it in the south, and sell it to profit at 25 cents the gallon. His experiments on the Sesamum are at variance with those made elsewhere; our Benny seed has afforded 80 to 90 per cent. of oil, and keeps well many years.

His experiments on volatile oils, will be noticed hereafter. C. S. R.

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9. *Confirmation of the Important Discovery of the property of* SULPHUR IN TREES, *to destroy all Insects preying on them.*

Farmers and Gardeners ought to hail with rapture a safe, certain, easy and unfailing mode of driving away or destroying all the insects, bugs, caterpillars, lice, ants, which prey upon trees and often kill them.

Numberless have been the means proposed or devised to get rid of these troublesome guests, most of which are dirty, costly, or unavailing. Our farmers appear to have given up in despair the hope of preventing the deadly attacks of *curculios* on the roots of peach trees, and the fruits of the plumb tree. Yet an efficacious mode is said to have been found several years ago in France, perfectly efficacious and applicable to all cases and all trees. The man who discovered it, deserved a splendid reward, yet his name has not even reached us. But we claim the honor to have been the first to make known the process in America, in 1823 in Kentucky, and

in 1827 in Philadelphia. Yet the most useful knowledge is so slow to spread, that the fact is hardly known yet, or doubted by those who know of it.

We are happy to be able to publish two direct experiments in support of the fact and discovery.

First. We bored and plugged with sulphur in the usual way, a plumb tree which commonly dropped every year all the plumbs before becoming ripe, the *curculios* lodging eggs in their germs. This was done when the tree was in blossom. On that year hardly any fruit fell, and the tree produced quite well.

Second. We find in the Genesee Farmer of January 28, 1832, that a young willow nearly killed by aphis or lice, and pissmires feeding on their honey, was quite revived in three days, and all the lice and ants driven off, by boring the tree with an augur five feet from the ground and three-fourths through the diameter, filling with brimstone and plugging tight. The tree has thrived ever since.

The modus operandi of this singular process is very easy to explain. The vital energy of the tree and sap, dissolves the sulphur, carries it into circulation, and evolves it in sulphuric gas evaporating through all the pores of branches, leaves and fruits. This gas is a deadly poison to insects and all animals, it suffocates them or drives them away as soon as they begin to smell it; but no injury whatever results to the tree.

We have never heard yet of any direct experiment on peach trees; but we are sure it will answer quite as well. If the sulphuric emanation could not reach quick enough the roots of the trees which are commonly attacked: the plugging must be done near the root or at the time of the descending sap, when it will sooner reach the roots. Let it be tried and the results made known. C. S. R.

10. HORTICULTURE.

Melissa Officinalis, or Balm.

The above is the figure of one of our finest garden plants, both fragrant and useful. The *Common Balm* introduced from Europe; but growing also wild in Virginia and Kentucky, or a species very near it. Every body likes the fine smell of the *Melissa*. A few plants are found or ought to be found in every good garden. It grows with the utmost facility from seeds and in any soil. Being perennial it lasts many years without any care, not even requiring watering. The whole plant is scented and has a peculiar grateful strong smell between lemon and monarda: which is produced by the essential oil of the glands. This fine volatile oil may be obtained by distillation, but only one pound is produced by 800 pounds of the fresh plant. It swims on water and is colourless, but becomes yellow by age. The flowers are small, labiate, bluish white, blossoming in summer.

In medical properties this plant is similar to many of the labiate plants; being one of the most grateful it is often used, making a fragrant tea and pleasant distilled water, vehicle for many medicaments. The tea and water are gentle diffusible stimulants, antispasmodic, expectorant, pellent, resolvent, &c.; they are useful in all obstructions, hysterics, headache, piles, pleurisy, asthma, cholic, palsy, several fevers chiefly nervous, &c. Another beautiful native plant not uncommon in our gardens, the *Monarda Coccinea*, Scarlet Balm or Oswego tea, is an equivalent that may be used when the common balm is lacking; but although stronger in effects, it is not quite so grateful.

This plant grows one or two feet high, with square stem and branches. Leaves opposite petiolate ovate acute serrate. Flowers axillary in half whorls, pedunculate, with oblong bracts.

It is the moral emblem of Gratefulness. C. S. R.

Melissa, lovely nymph and grateful plant,
The garden sides and shady groves adorns,
Becoming floral emblem of delight
And feelings sweet by gratitude evolv'd;
Among the scented tribes of labiate blooms
The first perhaps: in modest sweetness clad,
Not dazzling colors nor gigantic size;
By gentle maids beloved and feeling hearts.

11. BOTANY.

Part of a letter from C. A. AGARDH, *Professor of Botany at* LUND, *in Sweden, to Prof.* C. S. RAFINESQUE, *dated 26th June*, 1831. *Translated from the French.*

I have published, since 1825, besides many Memoirs inserted in the Literary Transactions, two pamphlets on a new theory of *Vegetable Physiology* in French, and the *Vegetable Organography* in Swedish and German. I am now publishing a *Vegetable Biology*, based upon this new theory. As soon as this shall be published, I mean to undertake the *Natural System*, on a plan more enlarged and correct than in my previous *Aphorisms*, and my *Classes Plantarum:* according to the new Physiological system, all will be considered in a different point of view.

My *Classes Plantarum* are but outlines: I have been far from deeming them perfect. I consider it a great honour and advantage to enter into correspondence with you, since you labour on the same subjects. I shall be glad to profit of your discoveries. But I cannot agree with you on the numerical accordance of classes in Animals and Plants. It appears difficult that the animals whose variable form depend on the medium of their existence, and their motions, food, &c. may agree with the classes of plants. But I suspend my judgment until I see your classification, when I shall communicate my remarks on it. I am also afraid that the positive characters can only belong to artificial groups of beings; natural groups can only have tendencies, since there are few immutable characters.

My new theory of Vegetation consists in proving that there are but two kinds or series of organs in plants:

1. Leaves or appendicular organs.
2. Buds or fulcrant organs.

But those two organs unfold themselves under six different forms:

1. Cotyledons and plumule.
2. Leaf and bud.
3. Bract and flower-bud.
4. Petal and stamen.
5. Carpophore and placenta.
6. Spermoderme and embryo.

Each of these pairs of organs form a degree of vegetation, or an age of it. Each flower that has several petals, or a divided corolla and calyx, consists of as many floscules. A decandrous flower only differs from a pentandrous, because the internal floscules or petals are sterile or without stamens. The application of this theory is immense. You will see it in my work. It would be well to translate my organography in English, that it may be examined and studied by the English Botanists, that do not read German.

Remarks by C. S. R.—The above

fragment on Botany is interesting; this new theory of Agardh is certainly an improvement on the actual belief of many eminent Botanists, that all the organs of vegetations are mere modified forms of the leaf, variously unfolded, separated, or soldered. Both, however, appear too systematical, and the roots, stems, fruits, &c. do not appear to be easily reducible to these notions. That positive characters do belong or ought to belong to each natural group of animals and plants, is to me as evident as day-light: the opposite opinion has been the great stumbling block to the beautiful natural method of Botany, and a great hindrance to its general adoption. Unless we admit this, there will be no line of demarkation between a man and a monkey, a dog and a cat, a rose and a blackberry, an oak and a chesnut tree.

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12. *Selection of twenty-four out of one hundred new species of Plants of North America, sent to Europe in* 1828, *by* C. S. Rafinesque.

1. *Anychia Polygonoides*, Raf. discovered, 1818. Stem dichotomous, lax, erect, puberulent; leaves patent, linear cuneate, acute, nearly smooth, stipules lanceolate; flowers solitary in dichotomy, subpedicellate, erect. From the mountains Alleghany, and estival like the three following, six inches high.

2. *Anychia fastigiata*, Raf. disc. 1820. Stem dwarfish, erect, puberulent, subdichotome, fastigiate; leaves adpressed, linear cuneate, acute; flowers crowded, fastigiate, secund, subsessile. From Kentucky, one or two inches.

3. *Anychia conferta*, Raf. disc. 1821. Stem erect, dichotome, puberulent; leaves linear cuneate, acute, serrulate; flowers crowded, fastigiate, bracteate, pedunculate. From knobs of Kentucky, annual, three or four inches.

4. *Anychia lateralis*, Raf. disc. 1821. Stem procumbent, dichotome, divaricate; leaves remote, short, linear cuneate, entire; branchlets unilateral; flowers sessile, lax or remote. Arid hills of Kentucky, one to three inches.

5. *Polygonum squamosum*, Raf. disc. 1818. Stem diffuse; leaves smooth, obtuse, linear longer than internodes; stipules scariose, acuminate, lacerate, elongate, equal to internodes; flowers solitary, axillary, sessile. From West Kentucky, annual, section octandrous, estival.

6. *Polygonum hyssopifolium*, Raf. disc. 1818. Stem erect, slender, ramose, striate; leaves lax, remote, linear, elongate, acute; stipules in cylindrical sheaths, end setose or ciliate; racemes filiform; flowers remote, often binate or ternate. Lower Ohio, annual? one foot. *S. G. Persicaria.*

7. *Urtica gracilis*, Raf. disc. 1818. Stem smooth, slender, yellowish, with four furrows; leaves opposite, remote and small, petiolate, lanceolate, trinervate, serrate, acuminate and smooth; capitules of flowers axillary, pedicellate, geminate, forming a whorl of four, shorter than petioles. From Kentucky, annual, estival, one or two feet high.

8. *Urtica verna*, Raf. disc. 1822. Differs from the last, by leaves ovate, acute, not acuminate; flowers axillary and subspicate; capitules nearly sessile, opposite. Kentucky, in woods: vernal, annual, one or two feet.

9. *Monarda rigida*, Raf. disc. 1818. Stem stiff, rough, hirsute; leaves sessile, ovate, nearly obtuse, stiff, ciliate, subserrate; capitule pedunculate, involucre pentaphyllous, lanceolate, ciliate, acute; as long as flowers; corolla smooth, apex of upper lip villose. In West Kentucky, hilly barrens, perennial, two or three feet high, flowers flesh coloured.

10. *Scutellaria radicata*, Raf. disc. 1818. Root annual, very long; stem small, ramose; leaves on long petioles, ovate, ciliate, obtuse, small, broadly serrate: flowers terminal, axillary, large, pubescent. On river Ohio, three to six inches, differs from

Sc. *parviflora*, by leaves petiolate and flowers four times as large.

11. *Scutellaria villosa*, Raf. disc. 1818. Stem erect, simple, hairy; leaves petiolate, ovate, obtuse, crenate, hairy; raceme bracteate, bracteas obovate, flowers opposite. Indiana and Kentucky, woods; flowers whitish, one foot high, estival, perennial? differs from *Sc. ovalifolia*, by leaves crenate and bracteas.

12. *Sarothra cuneifolia*, Raf. disc. 1821. Differs from *S. canadense* or *stricta*, (*Hypericum canadense*, L.) by leaves cuneate, linear, obtuse, lower obovate; flowers four times as large; calyx ovate; petals cuneate, twice as long as calyx. Kentucky, estival, one foot.

13. *Viburnum macrodon*, Raf. disc. 1818. Branches tetragone; leaves opposite, petiolate, smooth, but petiole and nerves pubescent, large round, base oblique, subcordate, margin with large teeth; cyme pedunculate, pubescent. Mountains Alleghany, shrub four feet high, vernal, white blossoms.

14. *Galium setaceum*, Raf. disc. 1818. Stem erect, diffuse, rough: leaves by six, cuneate, linear, mucronate, rough backwards on the edge: panicule lax, capillary: fruits smooth, pedunculate. Illinois, flowers white, near to *G. asprellum*.

15. *Eupatorium serratum*, Raf. disc. 1825. Stem erect, simple, rough, striate: leaves opposite, remote, sessile, rough, ovate, uninerve, acute, broadly serrate; corymb regular, pubescent; bracteoles linear; internal perianthe 5 phyllous, lanceolate, striate, 5 flore. On Potomack, Virginia, two feet high, flowers white, estival.

16. *Eupatorium pectinatum*, or *E. longipes*, Raf. disc. 1818. Stem erect, branched, striate, rough; leaves opposite on long petioles, ovate lanceolate, base abruptly acute end gradually acute, sharply serrate, trinerve smooth; corymb unequal, fastigiate; perianthe 8-10 flore, few scales, oblong, obtuse, hairy. On the Ohio river, three or four feet high, flowers greyish, estival.

17. *Eupatorium rupestre*, Raf. disc. 1821. Stems erect, simple, striate, white, villose; leaves opposite, sessile, lanceolate, acute at both ends, trinervate, rough, of a yellowish glaucous colour; corymb fastigiate, foliose; perianthe short, oblong, 5 flore; scales oblong, obtuse, pubescent, external ovate oblong. On the cliffs of the river Kentucky, one or two feet high, flowers whitish, estival. Near to *E. glaucescens* of Elliot.

18. *Aster hyssopifolius*, Raf. disc. 1818. Leaves sessile, adpressed, linear, acute, one nerved, entire, smooth; stem erect, pauciflore; flowers large, pedunculate; perianthe lax; scales cuneate, scariose at the base. In Illinois, one or two feet, flowers blue.

19. *Prenanthes rubida*, Raf. disc. 1822. Glabrous; stem striate, rubicund; radical leaves petiolate, lyrate; last lobe trilobe, unequally angular, angles mucronate; stem leaves sessile, lanceolate; flowers fasciculate, pendulous, red outside. Cumberland mountains and East Kentucky, two feet high, autumnal.

20. *Helianthus tenellus*, Raf. disc. 1822. Stem simple, uniflore, angular; leaves opposite, petiolate, ovate lanceolate, acuminate, remote, serrate, trinervate, tender, roughish; flower peduncle rough, perianthe lax, linear; rays few, elongate. Mountains, hills of East Kentucky, two or three feet high, flowers yellow, autumnal.

21. *Helianthus striatus*, Raf. disc. 1818. Stem erect, striate, pauciflore; leaves opposite or alternate, petiolate, lanceolate, acuminate, entire, above rough, with white dots, beneath subtomentose. Hills of Kentucky, two or three feet, flowers pale yellow, estival.

22. *Sisyrinchium albidum*, Raf. disc. 1822. Leaves striate, narrow, equal to scape; scape winged, wings striated, umbel multiflore, spathe

unequally 4 valved, pedicels erect; corols white, obcordate, mucronate; capsules globose. In West Kentucky, flowers vernal, scape four to six inches, slender; one valve of the spathe very long, rigid; three very small, scariose.

23. *Scirpus typhinus*, Raf. disc. 1804. Leafless; scape compressed, striated; spike terminal, cylindrical; scales ovate elliptic, obtuse, concave, smooth, rufous, with scariose margin. Pennsylvania hills, one or two feet.

24. *Scirpus nudus*, Raf. disc. 1804. Differs from the last by scape slender, not striate; spike small, elliptical; scales ovate, acute, scariose. Virginia, small, hardly a foot high.

Many other interesting plants were sent in this century, which may be noticed hereafter; such as

Lechea linifolia and paucifolia.
Juncus falcatus.
Neottia montana and gracilis.
Tradescantia rupestris.
Melanthium longifolium.
Collinsia purpurea.
Plantago gonophylla, &c. &c.

13. ZOOLOGY.

On the large wandering Tygers or Jaguars *of the United States.* By C. S. Rafinesque.

The Jaguars are the spotted Tygers of America, found from Mexico to Paraguay. It was supposed that none were ever seen further north or with us; they are hardly mentioned in our Zoological books, and their casual visits disbelieved by many when they hear of them. But Humboldt has lately ascertained that the striped Tyger of India, often wanders to the north as far as Tartary and Siberia. I will prove that the spotted Jaguars do the same in America, and wander as far as Kentucky and Lake Erie in latitude 42. This always happens in summer, and is not at all extraordinary, since our summers are as warm as in the tropics, and these carnivorous animals are known to range very far in search of prey.

Several instances of huge beasts having been seen in Louisiana, Arkanzas, and Kentucky could be collected by enquiries among old hunters. When seen at a distance only, they are commonly mistaken for large Panthers, our unspotted Couguar. When seen too near, the boldest hunters are afraid of them. When shot, nobody knows them, not even the Indians; and the skins are soldhigh at once for side-saddles. Sometimes the account gets into some newspaper, but is usually disbelieved or soon forgotten.

Harlan in his Fauna Americana only mentions that the Jaguar or *Felis onza* of the naturalists wander sometimes east of the Mississippi, which must be crossed by swimming. This animal comes as far north as Kentucky in lat. 38. While I was in Kentucky I heard of several having been seen and shot. Two of them, a male and female, did once make a stand near Russelville, and alarm many travellers, feeding on hogs, until a party of hunters went in pursuit of them, killed one, and drove away the other.

Before that another had been shot on the 6th of June, 1820, by Mr. John Six, on Green River, 10 miles south-east of Hartford, in Ohio county. The skin was brought to Frankfort and an account given in the papers. This animal appeared to be a true Mexican Jaguar. The body was 5 feet long and the tail 2 feet. It weighed 150 pounds before skinning. The back and sides were yellow with black spots curiously arranged in several rows, a row on the back much larger and extending over half of the tail, which was rather slender, with very long hair at the end. Chin, belly, and feet white, ears small round black outside, white inside. Whiskers stiff 6 inches long, black with the end white.

But another Jaguar still larger

and of a different species has lately been seen as far as Lake Erie, and lat. 42. One was shot by the Seneca Indians, to whom it was totally unknown, another was killed in the Alleghany mountainsof Pennsylvania, and an account given in the papers. These animals were totally distinct from the common Jaguar; they must have been wanderers from New Mexico or the Oregon mountains, and belong probably to a new species which I propose to call *Felis dorsalis*, owing to the black band on the back. There are several other species of Jaguars in South America, little known or not well distinguished.

Specific characters, FELIS DORSALIS, Dorsal Jaguar. Of a grey colour, neck fallow, a black line or band all along the middle of the back, two rows of ringed spots on each side, black above, brown below. Total length 10 feet including the tail, body 6½, tail 3½. Very different from *Felis pardalis* by size four times larger, neck and back, &c.

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14. *On the North American Couguars.* By C. S. R.

The unspotted Tygers, or Lions without mane, of America have been called Couguars from the Guarani name, or Puma the Peruvian name. There are several varieties of them in North and South America, not well known as yet; in South America they are red or black, which perhaps indicate different species. In North America, fallow or grey. All these are called *Felis concolor* by the zoologists and deemed identic. This may be doubted; we know too little of these animals to decide; as they are becoming scarce it is needful to preserve the knowledge of those yet extant. The following are on record or have fallen under my notice. They are called *Panther*, *Painter*, and *Catamount* in the United States. They winter with us.

1. Var. Yellowish, 8½ feet long. In Carolina. Dr. Mease.

2. Var. Entirely grey. Green mountains. Dr. Morse.

3. Var. Fallow; outside of the ears, feet and end of the tail black. Body four feet, tail nearly three. Seen in Kentucky.

4. Var. Back nearly black, sides dark reddish brown, feet black, body six feet, tail three feet, legs very short, only one foot long. In New Hampshire. Dr. Moose.

5. Var. Differ from the last by body five and a half feet, tail two and a half feet, feet twenty to twenty-two inches long, called Pennsylvania Couguar by Buffon. Alleghany mountains. These two last appear to deviate much from the species.

The Couguars being spread from Canada to Chili, or 90 degrees of latitude, must vary in their fur. Every traveller gives a different account of them, or calls their fur by a different name, black, brown, red, rusty, fallow, sallow, yellow, grey, &c. They may yet belong all to a single species; but these varieties or deviations must be noticed, as they are in man, the dog, the sheep, and other deviating animals.

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15. *Extracts from A Second Series of Zoological Letters written to* BARON CUVIER *of Paris, by Prof.* RAFINESQUE *in* 1831.

Extracts from letter 1, *March*, 1831.—I sent in 1821 to Paris, a memoir on fifteen Trilobites of North America, and published in Lexington the new *G. Isoctomesa* of that family, which Dr. Dekay has since erroneously called *Octomeris;* there is a *G. Octomeris*, already among shells; my Sp. was however different from his, being emarginated behind, and one of the largest Trilobite known, being nine inches long. It was preserved in the Cabinet of the University. There are also some very small Trilobites nearly like the Entomostraceous; such is my *Anopsites*

urocera, without eyes, of which I send you the figure.

I have found in Lake Erie, in 1826, two N. G. very near to the Trilobites, both lacustral living animals: both without antens and with concealed feet. I call them *Peltoma* with two eyes, and *Adelopus* without eyes. I send you the figures. Also the description and figure of another living sea N. G. from the atlantic shore between *Idotea* and my *Gonotus* of 1814. I call it *Mesotropis albipes*. Body oblong, back carinated, small head, no eyes, fourteen feet, tail with many articles and ciliated, two antens, *Sp. Car.* greenish-brown, both ends obtuse, antens equal to body and tail, feet white.

I send you the figure and description of a singular atlantic small sea shell, *Nemalix pelagica*, which suspends itself by a thread from the *Fucus natans* in the middle of the ocean, discovered 1815.

I send you, as you request, the figure, description, and a specimen of my *Trinectes Scabra*, a new G. of fish near to *Achirus* found in the river Schuylkill; it has only three fins, dorsal, anal and caudal. Also the description and figure of a large and beautiful new catfish from the river Tennessee discovered in 1823, *Pimelodus lutescens:* it was three feet long, excellent to eat, of a olivaceous yellow colour, belly white, jaws equal, eyes round, tail forked, first dorsal falciform, second dorsal nearly as large as the anal.

Extracts from letter 2, April, 1831. I send you the figure and description of two subterranean worms. The first *Ophelmis rugosa*, is near to *Gordius*, but dwells under ground like *Lumbricus*. It was found in New York six feet under ground in 1817, and was preserved in a museum. It was a gigantic worm, almost like a snake, three feet long. *Gen. C.* body fistular compressed, leathery, without viscera, not annulated but wrinkled diagonally on the sides. Tail trilobe, vent oblong inferior, lateral lobes short obtuse, middle lobe long cylindrical. *Spec. C.* fulyescent, wrinkles equal in length but not in depth, inside smooth filled with a yellowish liquid.

The second *Geonema gordinea*, was a subterranian Gordius found two feet under ground in Connecticut, with body filiform, fistular, filled with a fluid, elastic, the two ends equal attenuated, opening, hardly visible, *Spec. Description.* Flexuose fulvescent, both ends obtuse only four inches long.

Another akin N. G. but aquatic like *Gordius*, was found by me in a spring near the river Hudson in 1816. It differs from *Gordius* by body hardly fistular, head split or bilobe and tail simple. I call it *Cephachisma diphaia*. Length eight inches, size of a violin string, dark brown above, fulvous brown beneath, head clavate bilobe, tail obtuse black, with a white tip.

I have perhaps been the first naturalist, who has observed and studied the microscopical animals of infusions, swamps, pools, creeks, rivers, lakes, and the ocean, in America, and chiefly in Kentucky, as I once did in Sicily and the Mediterranean. This is quite a new world of animated beings, fecund and inexhausible. They swarm every where and are from a size so minute as not to be seen without a large magnifying power, sometimes one thousand times smaller than a grain of sand, up to a size visible to the naked eye, and even reaching a gigantic size, in the ocean; where I have seen some a foot long, although quite identic with the most minute, being in common always destitute of mouths, and therefore living by absorbing their nourishment by the minute pores of the body: whereby they belong to the peculiar class or division of animals nearest to plants, and merely differing by their spontaneous motions, which I called Porostomes as early as 1814 in my

Semiology, and illustrated in my Analysis of Nature in 1815. This name is very good, but if not agreeable to all, I have half a dozen others to offer as substitutes: *Biopores*, or *Zoopores*, or *Leptremes*, or *Adelostomes*, &c. Because it is my wish that this class or large section of animals should bear a good name given by me, instead of the delusory one of *Animalcula* or *microscopic animals*, which does not apply to all.

Besides it is very probable that many other, if not all the animals without mouths, must belong to this class; such as the mouthless Meduses, the Tethya, Alcyons and Spunges; perhaps some *Oscillatoria* and *Conferves*. These porostome animals are generally aquatic and floating: but there are some fixed ones also. Others are parasitical (like many worms) living in other animals. Some may be terrestrial like the *Geonema* above. The *Miasmata* or miasmic animalcula of the air, may be the invisible birds of this class, or aerial insects floating in the air. This may appear a bold surmise, but it is not preposterous; they have hardly been seen yet, but are perfectly well indicated already.

Lastly, there are also fossil animals of this class. They must have existed abundantly in the primitive earth; and some of those with a cartilaginous or leathery body have been fossilized. My fine N. G. *Trianisites* of 1818 may be one, also my N. G. *Bolactites*, *Geodites*, *Granulites*, *Trastinites*, &c. discovered in the oldest geological strata of Kentucky, and united proptem to the Alcyonites. Some may also have been akin to the actual *Nullipores* of the sea, which are real stony plants and not animals: having no motion whatever, being fixed, without mouths nor viscera; no polyps about them: a mere vegetative concretion of the sea with minute pores. Some naturalists even deem them a kind of marine stalagmites. We may well wonder how Lamark put them among animals. It was probably like the Porostomes, Corallines, and Spunges upon a mere surmise of animality. But I defy any naturalist to perceive any motion in them, or to find out their polyps or mouths.

I send you the figures and descriptions of ten N. G. of aquatic porostomes, which will demonstrate the variety of size and form. I described besides as early as 1814 the gigantic *Aproctomus* of Sicily, and in 1825 the large *Scalenium* of the ocean.

1. *Stigoma tripunctata*. Ocean, one inch, cuneate flat, head obliquely bilobe, tail mucronate, three dots on the back.

2. *Lobuloma inequalis*. Ocean, one line, flat with six unequal lobes on the margin.

3. *Thalanema capitata*. Ocean, two inches, filiform flexuose like *Vibrio*, but one end enlarged oboval obtuse.

4. *Zoocoilon levis*. Sicily, half inch, subglobular, truncate, with a large cavity occupying the whole inside.

5. *Polasmus pectinatus*. Sicily, one inch, oblong lamellar or pectinate beneath transversally.

6. *Diplepha gibbosa*. Lake Erie, half line, oblong sinuose, gibbose, two pairs of geminate bristles, a fifth at one end.

7. *Disynema isella*. Kentucky, pools, microscopic. Two threads united at both ends, like a conferva, but with free motion.

8. *Blobula varians*. Kentucky, infusory. Oblong sinuate, one end with five bristles, the other with one.

9. *Pecticoma paradoxa*. Kent. infus. oblong sinuate, ciliated beneath, bristles unequal three longest, one in the middle and another at each end.

10. *Loncoma incurva*. Kent. infus. oblong compressed shaped like a curved knife, the two ends acute, one raised up, no organs.

I send you also the figures and descriptions of five new fishes No. 3 to 7. *Zonipus punctatus, Semotilus notatus, Lepemiurus fasciolatus* and *bilineatus, Luxilus auratilus* and *Zonargyra virescens.* All observed in the waters of Kentucky since publishing my Ichthyology of the Ohio in 1820, except the *Lepemiurus.*

To be Continued.

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16. *Description of the Spelerpes or Salamander of the caves of Kentucky. By* C. S. Rafinesque.

In 1821 I discovered a new Salamander, dwelling permanently in the dark caves of limestone near Lexington. It never comes out to the light, being found there in summer. Its eyes are calculated for this life: they are large elliptical, with a large black pupil like the cats to shade them from the least access of light. It is called *Cave Puppet* in Kentucky, while the other Salamanders are named Ground Puppets. Several specimens were preserved in the Museum of the Lexington University, presented by Dr. Crockatt.

It appears to form a peculiar N. G. or S. G. among the Salamanders, which I call *Spelerpes,* meaning *Cave reptile.* Head round, broad and flat; mouth very large, split to the neck, jaws with small teeth, obtuse in the upper jaw, acute in the lower. Feet semi-palmated, anterior with four toes, hinder with five toes. Tail cylindrical, slightly compressed at the base. Eyes oblong with a pupil.

Spelerpes lucifuga. Entirely orange colour, covered with small oblong black dots all over, jaws equal. Tail very long, five eighths of whole length, which is from four to six inches.

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17. GEOLOGY AND HISTORY. *History of China before the flood.* By C. S. Rafinesque.

The traditions presented by many ancient nations of the earliest history of the earth and mankind, before and after the great geological floods, which have desolated the globe, are highly interesting; they belong at once to geology, archeoloy, history and many other sciences. They are the only glimpse to guide us where the fossil remains or medals of nature are silent or unknown.

Ancient China was in the eastern slopes and branches of the mountains of Central Asia, the hoary Imalaya, where it is as yet very doubtful whether the flood thoroughly extended. The traditional history of China speaks of two great floods, which desolated but did not overwhelm the land. They answer to the two floods of Noah and Peleg recorded in the Bible, which happened towards 3170, and 2357 before our era, and have often been erroneously blended into one by several historians. The second or flood of Peleg, or Yao in China, was caused by volcanic paroxysms all over the earth, and much less fatal than the first of Noah, or Yn-ti in China.

The following details are taken chiefly from the Chinese historians *Lo-pi* and *Liu-ju,* whose works are called *Y-tse* and *Uai-ki,* as partly translated by Leroux. Due allowance must be made for the allegorical and amplifying traditions; but truth may be sifted from them. The Chinese have few fables in their history; they deal in facts rather than fictions.

The first flood of China happened under the 8th KI or period called *Yn-ti,* and the first emperor of it, *Chin-sang* about 3170 years before Christ, or 5002 years ago. The waters overflowed the land, and did not return to their usual channels for a long while; the misery of mankind was extreme, the beasts and serpents were very numerous, the storms and cold had increased with heavy rains. *Chin-sang* collected the wandering men, taught them to unite to kill the beasts, dress their

skins for clothing, and to weave their fur into webs and caps. He was venerated for these benefits, and began a SHI or dynasty that lasted 350 years, or perhaps reigned 350 moons, equal to 27 years.

The two words KI and SHI, translated Period, and Dynasty or family, are of some importance; they may have other collateral meanings, and require a philological examination. As they now stand translated, they would make the world very old; since no less than 10 KI or periods are enumerated (we are in the 10th) wherein 232 SHI or dynasties of Emperors are said to have ruled in China, during a course of 276,480 years before Christ, at the lowest computation, or 96,962,220 years before Christ, at the highest, with many intermediary calculations by various authors. But if KI may also mean a dynasty or division or people, as it appears to do in some instances, and SHI an age, or a tribe, or a reign; the whole preposterous computations will fall, or be easily reducible, so as to agree with those of the Hindus, Persians and Egyptians.

There are now three principal religions in China, each having peculiar notions on the Creation, and early history, &c. as every religion elsewhere. 1. The *Ju-kiu*, religion of the learned and worship of ancestors. 2. *Tao-kiu*, or worship of spirits, a kind of Shamanism. 3. *Fo-kiu*, or the worship of FO, a kind of Budhism. All the diversity of opinions on those subjects found in various Chinese books, are owing to this. The various opinions and their concordance has never been properly attempted; yet it must be remembered that these three religions are in fact mere branches of the primitive religion of China, the TAN religion or worship of Heaven upon hills as altars, of which the emperors were pontiffs; somewhat like Judaism, Christianity and Mahometanism are in the western regions, the three branches of the primitive religion of Adam, Noah, and the Patriarchs.

Chao-kang-tse, of the JU religion, has established that the world is to last 129,600 years, or a period called *Yuen*, composed of 12 equal parts of 10,800 years called *Hoei* or conjunctions, of which the half or 64,800 years were elapsed at Yao towards 2357 years before Christ.

In the first Hoei, the Tai-ki or Supreme Being formed the Heavens by degrees, and by giving a motion to chaotic matter. In the second Hoei, the earth was produced in the same manner. Men and animals in the third, &c. The 10 last Hoei answering to the 10 KI, but in a different chronology.

Lopi and the most learned historians place at the beginning of things *Hoen-cun*, or the chaos, and *Puan-cu*, meaning remote antiquity. After which begin the three first KI, which are collectively called *San-hoang*, and commonly put down as successive periods or dynasties; but there are in my opinion many intrinsic proofs that they were contemporary. The principal is that they are sometimes called SHI as well as KI.

1. *Tien-hoang*, meaning Celestial Emperors, the very title yet of the emperors of China. They must have been the real primitive rulers of mankind in Thibet and Western China on the mountains: where the early history of the Hindus places a race of Heavenly kings, and the land itself was called Heavenly or Celestial. The rulers had many other titles, *Tien-ling* or Celestial Intelligence, *Chong-tien-hoang-kun* meaning Middle-Heaven-Emperor-Supreme, &c. To them is ascribed the discovery of pictured letters and books, with the rudiments of Astronomy. The 18000 years of their ascribed duration, may safely be reduced to 1384 years, by reckoning each year for a moon, as moons were the only primitive years, every where.

2. *Ti-hoang* meaning Earthly

Emperors, lasted also 18000 years or moons, 1384 of our years: which is an additional proof of contemporary duration. They are said to have been sons of the Celestial Emperors, and fathers of the next KI, all of which are sometimes personified. They must have been the primitive rulers of the Lowlands which were called Earth in opposition to the Celestial Mountains. To them is ascribed the discovery of the solar year of 12 months of 30 days, making the year of 360 days, as it was before the flood.

3. *Gin-hoang* meaning Human Emperors were nine brothers, sons of the Ti-hoang, who divided the earth among them, and built cities surrounded with walls, founded kingdoms and settled governments, becoming despotic rulers, while before or among the other two KI, the rulers were only patriarchs. Their duration is extended to 45,606 years, which if reduced to moons, would be only 3508 years. These GIN or men appear to be the *Jins* or *Genis* of the primitive Arabs and Persians, who came in contact with them in East Imalaya and Iran, famous in antediluvian history as good and beneficent beings, friends of the Peris, the ancient Iranians or Persians.

That these TIEN, TI and GIN were not KI periods, but rather SHI or families of mankind, is evident by no Dynasties being numbered among them. They are often collectively made a KI named *Sanhoangs;* but then the *U-long* form the second KI, while the third has no name and therefore no existence. I rather consider them as the three first KI, either implying three periods, or three divisions of mankind. And I find a fourth division in the U-LONG (sometimes deemed a fourth period) meaning *Black Monsters or Dragons*, a metaphorical name for the primitive Negroes of Asia, born in the sandy and sultry regions of Asia, from the GIN of whom they are deemed sons and successors. These *U-long* had five families or divisions, they were barbarians, dwelling in caves and on trees. This could not be if they had been successors of the civilized GIN.

Of the fourth, fifth, and sixth KI very little is said. Lopi ascribes 90,000 years duration to them including the *U-long*, which if reduced to moons, would still amount to 6923 years, a very long period; but it is very probable that they were partly contemporary with the *San-hoang*, and some of the barbarous branches of mankind, since they dwelt in caves, rather than towns. Their names were

4*th*. *Ho-lo*, formed of three families or tribes? (are they the ancestors of the *Lolo* tribes of south-west mountains of China?)

5*th*. *Lien-tong*, six families or tribes.

6*th*. *Su-ming*, four families or tribes.

The signification of their names which is most given, would perhaps trace their connection with other Asiatic Nations. The last resembles the Samangs and Shamans of Asia.

The seventh KI is called *Sunfei*, and had twenty-two families or tribes, of which hardly any thing is related, except that under the last SHI or family *Tse-she*, men were more civilized, but a flood happened which began the eighth period of *Yn-ti* as stated above.

After this flood, the history of China assumes a different form, and the names of the families, tribes or dynasties are given. The subject shall not be now pursued any further; the antediluvian history of China alone is here to be illustrated. It becomes very prolix as we advance. It has been sufficient to show and prove that the Chinese have traditions of the state of the earth before the flood, as known to them in Eastern Asia, that the Asiatic Negroes were antediluvians, and that the deluge of Yao, is not

that of Noah as generally supposed, which to support still more, the SHI between *Ynti* and *Yao* are given.

The eighth KI or *Yn-ti* had thirteen SHI or families, all named in history with some details, which I only deem as many Emperors.

The ninth was *Shen-tong*, with twenty-one SHI, which here turn out to be 21 Emperors instead of families! A convincing proof that the previous ones in more obscure times were such also. Here details abound likewise.

The tenth KI or actual period, opens with the three *Hoang* or August Emperors, called *Fuhi*, *Shin-nong*, and *Hoang-ti:* to whom great improvements, discoveries, and acts are ascribed. Fuhi has been very gratuitously taken for Noah, by some prejudiced historians, although no flood happened in his time, and thirty-five Emperors reigned between the flood and him: because with him some writers begin the regular history of China.

After the three Hoang, came the *U-ti* or five elective Emperors, of which Yao is the fourth, in whose time the flood of Peleg, which convulsed the whole globe, was felt in China during nine years in dreadful inundations, towards 2357 before our Era. In 2207 began the Hia dynasty, the first regular historical family. Much obscurity is found previously, the five Emperors were really six, one being soon deposed is often omitted. The three Augusts had each a dynasty often omitted, the head being only reckoned.

Fuhi had fifteen successors reigning altogether 115 years.

Shin-nong had seven, dynasty lasted 140 years.

Hoangti dynasty lasted 100 years.

Many other floods are mentioned since in Chinese history, as many as sixty-five; but they were all local and did not extend over the whole of China, although that of 185 before Christ was dreadful, and this or another formed the Yellow sea by overwhelming all the land between Corea and China.

The state of mankind before the flood of Ynti (or Noah, which agrees in time with the seventy computation) is represented as happy. China, called *Tien-hia* or Celestial Region, (universe) was ruled by benevolent monarchs who took nothing and gave much; all the world submitted to their virtues and good laws. They wore no crown, but long hair; never made war and put no one to death. Harmony even reigned between men and animals; men lived on roots, fruits and cattle, they did not follow hunting, property was in common, and universal concord prevailed. They did not therefore deserve the punishment of total destruction by a flood.

This interesting and important part of the early history of mankind, is not yet inserted in the would-be universal histories of the western Barbarians, as the Chinese call us. Our compilers for ages appear intent on destroying the little remnant of ancient historical knowledge as yet extant. Let it be revived.

I conclude by 3 remarks, 1 Geological, 2 Chronological, 3 Philological.

1. The Chinese account of the flood confirms the geological fact that the flood was attended with a change in the year from 360 to 365 days, with a change in the seasons, increase of cold, winds and rains. The increase of cold hitherto surmised, and in which I did hardly believe, is very important for the antediluvian Zoology and Botany. The increase of wild beasts, who had probably taken refuge in the mountains against the flood, is also important. It shows how animals were preserved as well as men, and does not militate against the Mosaic account, since the word translated ARK in the Bible is THEBA, which means refuge, and is preserved in Thibet.

2. Another Chinese book of chronology, *Li-ta*, followed by Morison, puts *Fuhi*, the founder of the Chinese Empire in 3369 years before Christ, this would change the whole series and does not co-ordinate well with Yao, Peleg and the Bible. But the Chinese have various Chronological systems as we have. As many as 70 have been based upon the Bible, reckoning from 4000 to 6600 years from Adam to Jesus Christ.

3. My orthography of the Chinese is the plainest and shortest I could use, based upon the Latin and Italian, except that SH is like English and CH also as in *Church*. The Chinese have the French U which I have expressed by UH. The word U (or OO in English) means Black and Five in old Chinese. The Negroes and the kingdom of U or the Blacks, have existed in South China till 280 before Christ, when they were conquered. It is said that there are even some wild negroes yet in the Mountains of Kuenlun, probably similar to the Samangs of Malaca.

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18. *Early Colonization from China by Sea.*

Towards the year 2670 before Christ, or 4502 ago under the Emperor *Hoangti*, ships were invented and built in China, by *Kongku* and *Hoa-huh*, by orders from the Emperor, with hollow trees and furnished with oars. They were sent to discover places beyond sea, hitherto inaccessible and where no man had ever been. Thus the first Chinese Colonies were established in many islands. The magnetic needle had already been invented under *Shin-nong* about 130 years before, or about 2800 years before Christ.

In 2037 before Chirst, under the Hia dynasty, embassies were sent to China from foreign countries beyond the sea; they came in ships to pay homage to the *Hias*.

In 1197 before Christ, under the *Fu* dynasty a branch of the *Shang*, a large colony was sent from China to Japan and other Western islands, from whence they drove the ONI or black devils (negroes) first inhabitants of Japan.

The exact time when the Chinese discovered or reached America is not given; but it was known to them and the Japanese at a very early period, called by them FU-SHAN, and frequented for trade.

These extracts from Chinese history, throw some light over the early history of Polynesia and America, without proving that the real Chinese ever settled in America, where there language is not found. But the Japanese and Luchus, evident children of old China, speak very different languages. China had formerly and has yet many dialects. The ancient *Gins* and *Tienhias* of China before the flood, and the *Hias* and *Shangs* since, may have come and partly colonized America. C. S. R.

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19. SCIENTIFIC EXPLORERS IN AMERICA AND AFRICA.

America.—Mr. Audubon is now engaged in exploring the Peninsula of Florida, for birds, and to collect animals, as well as all other kinds of natural objects. He has two assistants with him.

Mr. Drummond, the botanist, has been exploring the Oregon mountains for two years past, chiefly for plants and seeds. He was sent by some English botanists and gardeners. It is said that he took to St. Louis two tons of paper for preserving plants.

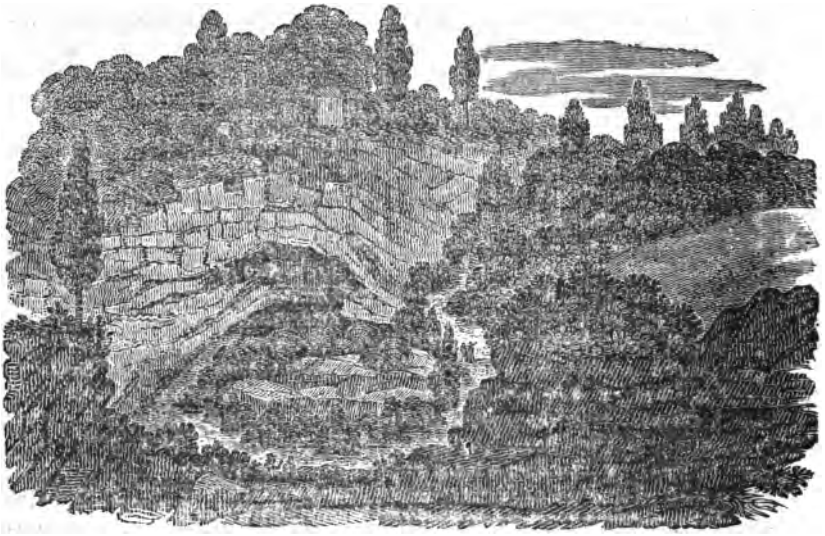
Mr. Peale is just returned from his voyage to South America, and travels in 1831 up the R. Magdalena to Bogota. He has brought a fine Zoological collection for the Philadelphia Museum, among which are 500 birds and 50 quadrupeds, which were not there. It is expected that he will publish an account of his zoological travels and discoveries. He asserts the very singular fact that the R. Magdalena has no shells and but few fishes.

Africa.—The mouth of the Niger or Quorra has at last been found by Lander to be as was surmised in the large Delta of Benin, 250 miles broad, and the R. Nun the main mouth. The bookseller Murray has paid him 1000 guineas for the Journal of his travels.

Douville, a French traveller, has explored Congo and reached inland to the N. E. as far as the lat. 4 d. south of the equator. He is just returned to Paris where he will publish his discoveries.

20. GEOLOGY.

ENTRANCE OF THE MAMMOTH CAVE OF KENTUCKY.



The Caves of Kentucky. By C. S. RAFINESQUE.

Among the various and curious geological phenomena of Kentucky, the numerous Caves of that region are not the least interesting. They have attracted long ago the attention of travellers and Geographers; but I was the first to examine them geologically and zoologically, from 1818 to 1826.

In the last war, between 1812 and 1815, they became of some importance by affording a good deal of Saltpetre by lixiviation of their soil. But all did not afford it, some contained a mere stone floor, or stalagmites, or a diluvial clay.

Their number is unknown, being too many for enumeration; perhaps fifteen hundred or more; of all sizes from ten yards to ten miles in extent. They are found chiefly in the limestone region or the calcareous strata; but the greatest number is situated in the central hilly region of Kentucky, where the limestone is covered by sandstone and slate hills; being however found in the lime below, visible in valleys; seldom in the sandstone itself. They extend through the three kinds of limestone, the Cherty, the Specular, and the Compact, chiefly this last. These limestones being of the oldest secondary or organic formation, called transition by some Geologists; but perfectly horizontal without any visible dip for 100 miles.

These various Caves are of seven different kinds, which I call

1. *Cliff Caves*, commonly called *Rock Castles or Rock Houses* in Kentucky. They are merely natural excavations in the cliffs of rivers, somewhat like chambers, always small, without stalactites, nor saltpetre. Common in East Kentucky, and on Rock-castle river, which takes its name from them. Not uncommon in sandstone and freestone.

2. *Fissure Caves*, found chiefly in the slaty or shaly claystone and coal region, being horizontal or vertical fissures in the strata, often without any communication with the outside. Rather rare, often concealed.

3. *Sinking Caves.* The outlets of the numerous Sinking Creeks,

being subterranean channels of creeks and streams, which after a course of 100 yards to one or more miles disappear in them. They chiefly differ from the last by having waters. Commonly inaccessible, being filled by the water. Very common, chiefly in West Kentucky, in the open glades called barrens of the sandstone table land.

4. *Spring Caves.* Giving rise to a stream which issues from them, either to join another stream, or sink in the Sinking caves. Only a modification of the last; but less common, sometimes quite accessible, forming vast caverns with a vaulted roof. Chiefly in the limestone regions.

5. *Crater or Funnel Caves.* Only in the limestone regions, very common, formed by circular or elliptical hollows, called *Sinks* in Kentucky, from twenty yards to one mile in circuit, and from five to fifty feet deep. Sides sloping inside, similar to the craters of volcanos, but more of a funnel shape, with a vent hole at the bottom, leading to a fissure, spring or cave. When this hole is choked up by earth, the basin fills with water and forms a pond. The sinks are, according to my eruptive theory of the limestone and clay formations, the springs, craters, or spouts from whence issued in the sea, that limy mud which spread horizontally, imbedding the fossils.

6. *Saltpetre Caves.* Large cavities with galleries and chambers, roof commonly flat, floor with a rich nitrous diluvial loam, commonly in the limestone. The largest of all is the *Mammoth Cave*, the entrance to which is figured above, and an account follows beneath. It is in these that bones of antediluvial quadrupeds have been found. Many were discovered while digging for saltpetre, but being often crumbling were lost, the best were scattered or thrown away, except a few collected by Mr. John D. Clifford and others.

The principal fossil bones found in them, and come to my knowledge, belonged to

1. The *Megatherium*, or an animal very near it.

2. My *Aulaxodon speleum*, since called *Megalonyx laqueatus*, by Harlan.

3. A kind of *Taurus*, either the Buffalo, or *T. latifrons.*

4. A small animal like a Polecat.

5. A smaller one yet, perhaps a *Sorex.*

The animals still living, or rather wintering in those caves, where the temperature is very mild and equal, are bats and rats of many species, and my subterranean Salamander, *Spelerpes lucifuga*, which is permanent there.

There also have been found a few ancient mummies, not antediluvian, but buried in the diluvium, and quite preserved by the antiseptic nitrous soil; they are not numerous, rather accidental than otherwise.

7. The seventh and last kind of caves, are the *Stalactical* Caves, similar to those of Europe, filled with stalactites and pillars, as well as stalagmites rising from the ground. Rather uncommon and always in the limestone.

To give a tolerable idea of these caves, I shall describe some of them, out of several series.

Jenning's Spring and *Lovedale* are two sinking caves of the 3d and 4th Series, between Frankford and Lexington; both in the limestone and shaped like an excavated bow, with a large spring at one end and a sink at the other. Jenning's spring turns a mill, the excavation is 150 yards long, 3 to 6 wide, and only 2 or 3 deep. Lovedale could also turn a mill, but has none. It is rather a chasm, 200 yards long, 10 wide, and 10 deep.

Elkhorn Cave belongs to the 4th Series; it is in the cliffs of Elkhorn creek north of Lexington, like a fine hall, with smooth limestone walls, accessible for 100 yards and more, about 10 yards wide and high. A

fine stream issues from it, quite perennial and emptying into the Elkhorn about 60 yards from the cave.

Deer Lake belongs to the 5th Series. It is one of the largest natural ponds of Kentucky, where being rare, it is deemed a lake. Somewhat circular, nearly two miles in circuit, constantly filled with water, without any outlet. It is between Green River and Glasgow, at the entrance of the Cumberland limestone region, where smaller sinks and ponds are common; evidently one of them, filled up by water.

Crawford's Little Cave, one mile from Mount Vernon in the sandstone region, is 200 yards long, full of beautiful stalactites.

White Cave, near the Mammoth Cave, is another with handsome white stalagmites of many shapes on the floor. It was not there, as stated erroneously by Harlan, that the *Mulaxodon* was found, but in the *Mummy Cave* near it; a saltpetre cave, where 3 mummies were also discovered.

Bryan's Cave, near Lexington, is a small dry cave, in limestone, with a small spring at the entrance. It is like a crooked gallery, 380 steps long, 6 to 10 feet high and wide, with an even floor and roof. It is used by Mr. Bryan as a spring house. It had hardly any diluvial matter, but has a vent or air hole.

Big Cave, in Rockcastle county, nine miles east of Mount Vernon, on Crooked Creek, is a fine saltpetre cave, 700 yards long, surface about 12½ acres, divided in many rooms and branches. Breadth and height from 5 to 40 feet. There is a spring in it without outlet, but no stalactites. As much as 1000 lb. of saltpetre was made there in one single day.

Mammoth Cave. The largest saltpetre cave in Kentucky, near the south side of Green River, in the sandstone hills; but quite in the limestone beneath. Entrance in a cleft or chasm, very picturesque, of which a figure is here given, drawn by myself. I also made a correct map of it as far as I went, which is very different from those popular *catch-penny maps* already published. In fact, all the popular accounts of this cave, inserted in the ephemeral press, are quite false, exaggerated, or fabulous. Such is that copied in the Saturday Evening Post against my consent, with my figure. The best account is that given by Farnham in the Archeologia Americana; yet it is also lame and imperfect. It has many branches, all in the gallery form, with a flat roof, but very uneven floor, ascending and descending, with many fallen stones forming sometimes hills. The branches are crooked, like a labyrinth, sometimes descending under each other, with springs and a few stalactical pillars. Fanciful names have been given to these branches, galleries, called rooms and halls when expanding. The whole length is yet unknown, being very difficult to penetrate after 5 or 6 miles, but 9 to 10 miles have been reached, and are supposed to extend under the bed of Green River, which I doubt, as the whole cave appears to have been once the subterranean bed of a stream, which emptied into Green River, not far from the entrance, where the chasm leads and reaches the river. Much saltpetre was made here between 1814 and 1816; vats, oxen, and negroes employed, as in a manufacture; 25 miles of extent in branches were explored to seek for the nitrous earth; no bones and no mummies were found there. The sides of the galleries are commonly smooth and of compact limestone, incrusted with efflorescence, native nitre, glauber salts, yellow ochre, calcareous incrustations, &c. in various places. They cover the few fossils of the strata, yet I observed some Madrepores, a fine *Mastrema*, and a *Turbinolite*. In a room, a kind of black flint or rather chert is found, indicating the cherty limestone.

The temperature of this cave is

permanent, at about 56 degrees; therefore cold in summer and warm in winter. It is the wintering quarter of thousands of bats of five new species of mine which resort to it in winter only from 100 miles around: and remain suspended to the roof in a half sleepy or torpid state. Each species appears to occupy a gallery or room by itself. Large rats dwell there also in winter and feed on the bats they can catch or who fall; no snakes dwell there. In coming out of it in summer after an exploration, the outside air appears as sultry as an oven, and in winter so cold as to chill and be dangerous for the health, by the sudden change.

This cave upon the whole appears very similar to one of Siberia described by Gmelin. The roof is flat and lofty throughout.

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21. *Geological Strata of Ohio and Kentucky. By* C. S. R.

The following are the series of Geological formations extending from Lake Erie in lat. 42° to Tennessee in lat. 36½° through Ohio, Indiana and Kentucky, chiefly extracted from my Geology and Oryctology of Ohio and Kentucky. They are, as well as the Physical geography of these large states, almost unknown. The maps and accounts of Maclure and James are quite erroneous.

The series begin at the deepest or lowest formation and strata nearly at the level of the sea, up to the highest in the Cumberland mountain about 1700 feet above the sea. But the tertiary formation or latest do not rise so high. They are all horizontal or nearly so, belonging to the Floetz formations of Werner. They all contain more or less fossil remains of the most ancient order, including Alcyonites, Corals, and Trilobites, of 1000 new G. or N. Sp. mostly different from those of Europe and the Atlantic states.

Primitive boulders are only found thinly scattered through Ohio as far south as lat. 39°. I never saw a single one in Kentucky, but many gritty and limy angular boulders in some places.

Successive Series, by Age.

1. Lowest series of formations—Limestone.
   1. Compact L. Grey chiefly.
   2. Specular, blue.
   3. Colitic, white.
   4. Shaly.
   5. Cherty.

2d Series. Carbonic.
   1. Clay slate.
   2. Bituminous coal.
   3. Foliated slate.

3d Series. Grit (*Grès* of the French.)
   1. Pebble stone.
   2. Freestone.
   3. Gritstone, highest stratum.
   4. Sandstone, brown chiefly.
   5. Iron stone.

4th Series. Clay.
   1. Ferruginous clay.
   2. Saliferous clay.
   3. Marly clay.
   4. Potters' clay.
   5. Common clay.

5th Series. Alluvial.
   1. Diluvium.
   2. Alluvion.

But these formations do not always occur together; many are often lacking. When present the above is their respective position or most general succession of superincumbence. However there are many anomalies of position in various places, which baffle all the actual fanciful systems of Geology; but find a very easy solution in my natural theory.

For instance, beds of coal are sometimes found between the strata or beds of limestone! instead of slate. Elsewhere between sandstone above the slate. Large beds of limestone have often strata of clay from 1 to 6 inches thick between each stratum of limestone, either marly or saliferous clay. Thus the coal and clay are out of their natural position, breaking the series made out in Europe for the whole world.

The Oolitic series which had been denied to America, I have found in the Cumberland basin, but reduced to a thin stratum, imbedded in other limestone. This Oolite is not the false Oolite of Europe, or granular sandy limestone; but the true Oolite, formed by small white hollow globules, similar to the roe of fishes.

My natural geological theory of these western strata, which was taught in my lectures in the University of Lexington as early as 1819 and 1820, consists in deeming all these formations, beds and strata, without exception, formed by alternate submarine eruptions of matter, slime or water in the primitive ocean, from oceanic SALSES or volcanoes without fire. The diluvium was formed by a flood of eruptive waters when the land had been uncovered by the ocean. This theory I am prepared to support and maintain, prove and defend against all the geologists of England, France, America, or the whole world: whatever be the system they may have formed by looking at a few European or local formations elsewhere.

The minerals found in them are chiefly iron, hematite, pyrites, lead, zinc, manganese, calcedony, jasper, onyx, chert, quartz, barytes, amethyst, beryls, spars, marlstone, bolites, nitre, salt, bitumen, sulphur, alum, vitriol, geodes, &c.

22. MINERALOGY.

Gold Mines of North America. By C. S. R.

The gold mines of the United States, were known to the Indians in 1539, when Soto invaded them; but they had the ability to bewilder him, and conceal them. Else this country would have been colonised or desolated by the Spaniards. The French of Laudoniere and the first settlers of Virginia also vainly sought them. Their knowledge was almost lost, when discovered again in N. Carolina towards 1804. The first gold sent from thence to the U. S. Mint was in 1814. The quantity was small, but has been increasing ever since. In 1830 the Mint received and coined $134,000 of gold, of which

$128,000	from N. Carolina.
3,500	S. Carolina.
2,500	Virginia.

But last year, 1831, the quantity received and coined was $798,000: a prodigious increase of $670,000 in one year.

$476,000	from Georgia.
294,000	N. and S. Carolina.
26,000	Virginia.
1,000	Alabama.
1,000	Tennessee.

At this rate, the southern states will become a gold mining country. The gold is chiefly found in diluvial and alluvial barren tracts near the primitive granitic range, called Blue mts. or Kitaniny, where it blends with the Apalachian mts. the southern termination of the gritty Alleghany. It is procured by washing chiefly. Some veins have lately been found, and begin to be worked.

The Cheroki country, which is in the very centre of such region and mountains, is supposed to be very rich in gold, having perhaps veins of it in site. This has increased the cupidity of the Georgians, who have invaded those mines, and want to compel the Cherokis to evacuate the land; by nearly imitating the Spaniards, and making the Cherokis (who are as civilized as the Georgians) outlaws in their country.

Gold mines bring no solid wealth, they are soon exhausted, or the proceeds wasted. Georgia will find it out at her cost. Meantime companies and adventurers are pursuing this delusive search; some succeed, but as many fail or hardly procure gold enough to repay their expenses. But sterile worthless lands are becoming valuable, and often sell at random and high rates to speculators.

23. COMMERCE.

Plan of a new Trading Voyage, of Industry and Science.

Our nation is the most enterprising in the world, in maritime Commerce. Our mariners penetrate in all the seas in pursuit of gain, trade, and fisheries. The whale and seal fisheries have been sources of wealth and comforts for all the sea-ports which have undertaken them. The most arduous of all, that of whales, chiefly pursued in Nantucket, New Bedford, and latterly Hudson, is a nursery for hardy seamen. About 50 ships are constantly employed in it; the whole crew go on shares instead of wages, and often make small fortunes to settle at home afterwards. The whales have been pursued all over the globe, and latterly in the stormy seas of Japan. The sealing voyages are equally arduous, requiring a residence on desolate islands, the austral frozen lands of Gheritz, South Shetland, &c.

We mean to propose another trade or fishery somewhat similar, less dangerous, less arduous, yet quite as profitable, and without any of the bad chances of the whaling and sealing voyages, which are sometimes precarious. We hope that our hardy mariners and enterprising merchants will listen to us and try this new commerce; making money by it, at the same time that they advance science and knowledge.

Here is the object and plan.

A vessel must be fitted out to cruize all over the seas, to pick up, preserve and bring home, a whole cargo of fishes, shells, sea-birds, seals, and every thing produced by the ocean, the shores, or accessible rivers. Besides landing in many parts and collecting in the same way, land animals, quadrupeds, birds, snakes, land shells, minerals, specimens of rocks, plants, seeds, &c.

That such a scientific voyage may be made profitable is proved 1. By the great price paid in the U. S. already by showmen for living animals brought for sale, elephants, rhinoceros, camels, lions, &c. 2. By the good price paid for their skins when they died in the passage; the skin of a rhinoceros sold for $500 for a museum. 3. By the value which shells and corals have had, even when common and sold at auction, while rare ones fetch high prices. 4. By the increasing taste for natural history, geology, mineralogy and botany, all over the United States. 5. By the number of museums already established, and their competition to have rare things. 6. By the private cabinets increasing every year. 7. By their multiplicity when cheap objects will be procurable. 8. By the wants of universities, colleges and schools for museums, mineralogical cabinets, herbariums, &c. 9. By the several learned societies, zoological, geological and philosophical vying to collect rare specimens and sets of rocks, minerals, plants, animals, &c. 10. By the need of botanical gardens, gentlemen, farmers, &c. for seeds of curious plants or useful productions, &c. &c.

There is no fear that a whole cargo would be unsaleable: a market for it would be found in all our large cities, and chiefly Philadelphia, New York, Baltimore, &c. But besides the whole of Europe would be open to us as a market, for in France, Germany and England alone, there are 5000 museums and cabinets, constantly buying. We have even heard of a whole cargo of 400 tons of sea shells in bulk being sent from Peru to London not many years ago. When these objects shall be brought home in plenty and cheap, as many museums and cabinets can be formed in the United States before the year 1850.

Therefore such voyage, trade and speculation, will be available and profitable. The cost will be almost nothing; every thing is to be got by the crew, without half of the labour and disasters attending sealing and whaling. A small vessel, brig or schooner of 120 to 180 tons would

do for the first experiment, 12 to 16 men could navigate it, half the number required for whaling. The outfits would be only staves and planks to be made up into casks and boxes on board, some casks of liquor to preserve fishes, &c., large fishes may be eaten and the skin only preserved in brine. Shells and stones cost no trouble to pick and keep. Some paper for drying plants, salt, nets, bottles, &c. Besides one or two years provisions for the small crew. No port charges to pay, the vessel need not go into any port to trade. The outfits may be insured just like those of whalemen at 5 or 6 per cent. per annum only.

We should not advise the vessel to be fitted for sealing and whaling at the same time; because it is more expensive, and the crew might neglect the object of the voyage in pursuit of whales. We should rather advise, if a greater capital is disponible, to fill up the ship with articles that may sell with some profit at ports in the way, such as flour and provisions, &c.; or else to take out a freight to the West-Indies or Brazil at the outset, and set off from thence on the voyage.

We deem that a captain of common capacity, but some education, would do to conduct such a voyage; if he has some acquaintance with science, or will follow the written instructions closely still better; otherwise there must be a supercargo on board, acquainted with natural sciences, to direct the proceedings.

As to the places to go, no one can go amiss. Any where will do; but the most healthy, fruitful, and unexplored countries best of all. For instance: Brazil and Patagonia, Chili, Peru, Guatimala, West Mexico, California, East coast of Africa, Borneo, Philippines, New Guinea, Australia or New Holland, the South Sea Islands, &c.

Any one exploring the coasts of those countries for one or two years could not fail to bring a valuable cargo of all these natural notions, from a huge Sea Elephant, head, skin and all, down to 10,000 fishes picked up at sea; and 5000 kinds of shells, 200 of each kind would be one million, which at one cent apiece only amount to $10,000, and some shells will be worth a dollar instead of a cent.

Calculation of a cargo at the lowest prices:

1,000;000 shells at 1 cent	$10,000
10,000 fishes at 25 cents	2,500
Minerals, rocks, fossils, &c.	2,000
Living animals -	2,000
Other animals preserved	2,500
Preserved plants and seeds	1,500
	$20,000

The outfits could not cost more than $2,000, the ship freight for hulk alone $100 per month, or $2400 for 2 years; say $5000 with insurance; remain $15,000 profit. The half or $7500 to the crew, which in 20 shares would give $375 for each, and the other $7500 for the outfitters, being 375 per cent. profit on $2000 for two years! But perhaps by better sales, $500 to 700 may be divided on each share.

All this is so plausible, that we invite the experiment to be made at once, and any ship owner or whaler who will undertake it may receive encouragement in Philadelphia, by writing to us post paid, if no one will try, we mean to try it ourselves, by chartering a small brig, and raising the $2000 outfits by dividing them in 20 shares of $100, of which 3 are already subscribed.

We shall be proud of being the first to open a new source of industry and knowledge to our country. We have had this plan in contemplation for several years past; but have waited to publish it, until we have seen the time arrived when it can be made very profitable. Formerly, when younger, we should have been delighted to go on such a voyage; but then science was not yet budding as it is now. We must depend on some active young man

to go as supercargo, who can keep a good journal of the voyage, and note the places where every thing is found. The Rensalaer school might perhaps furnish some pupils suitable for such a scientific undertaking, or else some other Institution and college; let them apply to us post paid.

The outfitters' shares are to be 20, as stated, of $100 each, and the crew's shares as many, held by 16 persons as follow:

1 A captain	-	3 shares
1 A first mate	-	2
1 A supercargo	-	2
1 A third mate	-	1½
1 A surgeon and 2d sup.		1½
1 A carpenter	-	1
7 sailors, each 1	-	7
1 A cook	-	1
2 boys, each ½	-	1
16 men and boys		20 shares

C. S. RAFINESQUE,
In behalf of himself and others in Philadelphia.

24. ATLANTIC REVIEW.

We propose as far as our limits will allow, to give Analytical and Eclectic Reviews, of the principal American works which increase or revive knowledge. Meantime we now give the titles with critical notices of some such, lately published in America, which may thus be reviewed hereafter. We mean to notice in this manner, all valuable American works as they appear.

1. Researches Philosophical and Antiquarian concerning the Aboriginal history of America. By J. H. M'Culloh, Jr. M. D. Baltimore, 1829, 1 vol. 8vo fig.—Very good book, so far as it goes, many omissions, but much latent knowledge on America is here revived.

2. Narrative of the Captivity and Adventures of John Tanner, who resided 30 years among the Indians. By E. James, M. D. New York, 1830, 1 vol. 8vo fig.—Romantic, but with much additional information on Indian manners and languages. The *Metai* Graphic system of the Lenap tribes with 110 glyphs or characters is peculiarly curious and novel.

3. David Cusick's Sketches of the Ancient History of the Six Nations (Onguys or Iroquois) Lewistown, 1827, 12mo. Very curious little work by a Tuscorora Indian, giving the traditions of the Onguy tribes. The whole new and important for American history.

4. Travels in Malta, Sicily and Gibraltar. By Andrew Biglow, Boston, 1831, 8vo. fig.—A prolix tourist giving some important details on Etna, &c. mixt with some errors.

5. Visit to the South Seas in 1829 and 30. By C. Stewart, New York, 1831, 2 vols. 12mo. fig.—Lively narrative and picture of the Sandwich and Society islands in their new improved state, affording some increase to our knowledge.

6. Memoir of Cabot, author anonymous! Philadelphia, 1831, 8vo.—A work of historical and geographical scrutiny and criticism, reviving lost knowledge: but anonymous critics are seldom believed.

7. A mariner's Sketches, anonymous. Providence, 1830, 12mo.—A lively but superficial work with many good maritime details; the most valuable are on Gheritz land and the seal fishery.

8. Tour to Greece and the Mediterranean. By Samuel Woodruff, Hartford, 1 vol. 12mo.—Agent of the Greek committee and gifts to Greece. Some useful information on Malta and Greece.

9. Observations on Greece, by R. Anderson, Boston, 1830, 12mo.—A modest title for good travels in Greece. Sent by the foreign Mission Society. Much useful information.

10. Natural History of the Bible, by Thadeus Harris, Boston, 1830, 8vo. Learned, curious and useful book; few mistakes. The ancient names of natural objects given there, are of importance on many accounts.

11. Cuvier's Discourse on the Revolutions of the Globe. Translation, Philadelphia, 1831, 12mo. A classical book badly translated.

12. Cuvier's Animal Kingdom, translated by Dr. M'Murtrie. A classical work in Philosophical Zoology, but deficient in details. Cuvier deserved a better translator: he is here mutilated and perverted. The appendix is quite deficient.

13. Lindley's Introduction to the Natural System of Botany; with the arrangement of the American Genera under the Natural Families, by Dr. John Torrey, New York, 1831, 8vo. Good work, the first attempt to introduce the improved Botany of Europe into general use here. But many omissions and imperfections yet, both in the text and appendix.

14. Cyclopedia Americana, translated from a German Lexicon with additions, by several collaborators; Philadelphia, 1830-32. Several 8vo vols. half completed. Neither a Cyclopedia, nor an American work! but a medley, similar to Nicholson's; made popular as in Germany by puffs: useful as far as it goes to diffuse knowledge; but unfortunately neglecting many solid and practical portions of it. Some sciences not even mentioned.

15. Monthly American Journal of Geology and Natural Sciences, by C. W. Featherstonaugh, Philadelphia, 1831 and 32, fig. Useful periodical work well begun, but containing as yet but few materials on American Geology and Oryctology, which

require active exertions and travels to collect.

16. Voyages of the Companions of Columbus, by W. Irvin; Philadelphia, 1831, 8vo. A needful revival of American knowledge, made popular by the style and fame of the writer, like his life of Columbus.

17. History of New Plymouth, by F. Baylies, Boston, 1830, 2 vols. 8vo. A prolix but valuable fragment of North American History. Much historical knowledge is here revived. It extents from 1620 to 1692, when New Plymouth was united to Massachusets.

18. History of Louisiana by Barbé Marbois, translation, Philadelphia, 1830, 8vo. Well written, but deficient in the early history; better in later times.

19. History of Pennsylvania to 1776 by Gordon, Philadelphia, 1828, 8vo. Well written, few omissions, a creditable work.

20. History of New York, by Moulton. New York, 1st and 2d parts, 8vo. 1824 and 1826. Excellent work, copious on early history, only carried as yet to 1633.

21. Treaties of the United States with the Indian tribes; Washington, 1826, 8vo. published by order of Congress. Furnishing important official documents for History.

22. Annals of America, by Holmes, 2d edition, Cambridge, 1829, 2 vols. 8vo. False title: it is a Chronological History of the English Colonies of North America only, and the United States; compendious, yet lame.

23. Travels in Guatimala or the United Provinces of Central America in 1827-8, by Dunn, New York, 1828, 8vo. Interesting account of a country almost unknown, by an agent of the Bible Society; rather superficial, but many additions to knowledge.

24. Sketches of a Tour to the Lakes in 1826-7, by Th. L. M'Kinney, Baltimore, 1827, 8vo. fig. Tedious Epistles of a tourist or rather Indian agent; but some addition to knowledge may be gleaned therein.

25. Narrative of a second Expedition to the shores of the American Polar Sea, by Capt. J. Franklin and Dr. J. Richardson, Philadelphia, 1828, 8vo. Important addition to geography, geology and all the cognate sciences.

26. Ornithological Biography of the Birds of America, by J. J. Audubon, Philadelphia, 1831, 4to, first volume, containing the Biography of 100 Birds. Excellent work of an author uniting the characters of a naturalist, a painter, a traveller, and a close observer. It is the text of his gigantic work on our birds, or their colored figures of natural size, a splendid monument of genius and fine arts.

27. Medical Flora, or Manual of Medical Botany, of the United States of North America, by C. S. Rafinesque, Philadelphia, 1828-30, 2 vols. 12mo. 100 fig. A very useful compilation, embodying all the actual knowledge on our Medical Botany, with a multitude of original additions, both medical and botanical.

28. The Pulmist, or the art to cure and prevent the Consumption or Chronic Phthisis, by C. S. Rafinesque, Philad. 1829, 12mo. fig. This little work teaches what many physicians wrongly despair of, how to cure effectually this fatal disease; *nihil desperandum!*

29. Enumeration and account of some remarkable Objects of the Cabinet of Prof. Rafinesque, Philad. 1831, 8vo. tract. In 16 columns this tract describes 110 New objects of Zoology, chiefly fossils of Kentucky, more than thick volumes often can do.

30. Monograph of the Bivalve Shells of the river Ohio, by C. S. Rafinesque, translated from the French of 1820 by C. A. Poulson, Philadelphia, 1832, 12mo. 1 fig. 68 sp. The first original work on our fluviatile chonchology. The translator has omitted the 70 figures of the original, and the continuation carried to 113 species published in 1831. He might also have added the posterior synonyms to aid the students.

31. Manual of Botany for North America, by Prof. A. Eaton, fifth edition, Albany, 1829, 12mo. A popular compilation; few reach here so many editions; this last is much enlarged and improved, including the southern plants of Pursh, Nuttal and Elliott, but no one else: therefore deficient as a compilation for general use.

32. Geological Text Book on North American Geology, by Prof. A. Eaton, Albany, 1830, 8vo, fig. and a Geological map of the state of New York. Tolerable attempt so far as New York is concerned, but totally deficient in oryctology or fossil remains, and mistaking the geological region from Boston to Lake Erie for the whole of N. America, as the English Geologists mistake the Geology of England for that of the world.

33. Webster's Dictionary of the English Language, Boston, 1830, 2 vols. 4to, and abridged in a thick 8vo. Bulky, elaborate work, adding many thousand words to our Lexicons; but lacking yet as many more. The Etymological part is copious, yet totally deficient in the Sanscrit, first parent of the English as well as Latin and Greek, and where all their words, without hardly any exception, can be traced.

25. MISCELLANY.

Periodical Press.—Nearly 1000 periodical publications of all kinds are printed in the United States; but some are of very limited circulation, supported by Advertisements and the monopoly of low rates of postage. In France, they have doubled since the Revolution of July 1830. They were 210 before, of which 150 out of Paris; now they are nearly 400, of which 310 out of Paris.

A Geological Society of Pennsylvania has been established in Philadelphia on the 22d February, 1831. Mr. Gibson is the president and P. A. Browne, secr'y. It has chiefly in view a complete geological survey of this state.

Phthisis or Consumption.—In 1831, the

deaths from this fatal disease have been 4807 in London, out of 25,337 total deaths, or nearly one in five. In New York, 1023 out of 6382, or nearly one in six. One-half, at least, of these victims of credulity in the ignorance of the faculty, could have been saved and restored by reading the Pulmist, and following its directions. In Philadelphia, only 673 deaths from Consumption happened in 1831, out of a mortality of 4939, or less than one in seven, about 1 in 7½. Is not this difference to be partly ascribed to the Pulmel being more used there than in New York, and not yet introduced in London?

26. FRAGMENT OF A PHILOSOPHICAL POEM ON KNOWLEDGE.

Truth is the sun, and Knowledge solar light
Streaming from truth, in beams effulgent bright,
To shine upon, delight, adorn, and bind,
By links of love, the human soul and mind.
* * * * * * * *
Yes, God and truth are one, and both, what is,
Has been, will be. And truth we may well deem
That part of God, which we can see and feel.
To store the mind with rays of knowledge bright,
Is sharing truth, a beam divine to hold.
Those who neglect or spurn this lofty aim,
In mental darkness live, and blindness creep
Through life; while those who seek shall ever find
What they require, as God and truth have said.
A wish soon leads to active mental search
Of many kinds, to suit the taste of all.
Happy the men who feel the noble wish,
And with delight the flow'ry path pursue;
But happier still when truth has reach'd the mind,
In streams of light of many hues and shades.
By thrilling sway, the dazzling flood delights
To fill and feed the human soul with joys.
We crave, and we receive the daily streams
Of lovely truth, from youth to age imparted:
The more we crave, the more we do receive
Without disgust, since knowledge never cloys.
How sweet are those delightful tasks of truth,
Inviting men to share the joys of heaven,
Ere they can reach this last eternal home
Of virtuous souls and minds. Through earth and sky
The mental range is found to roam at will,
And ramble freely there in search of science,
Subservient to the call of daring man:
While grateful truth becomes, his friend and tool
Of him who was, who is, an atom born
But yesterday, to shine awhile and sink.
Yet truth eternal dwells with him this while,
And at his call does not disdain to lead
By gentle steps, from dross to gold divine,
His craving mind; from dark to brighter regions
Of knowledge pure, a lofty daring flight
They take, to reach the scope of human life,
The thirst for light and bliss; the source of both
To find, around the throne of HIM, who rules
The world on high. Since God and truth are one!

C. S. R.

ERRATA.

Page 22, col. 1, *for* presented *read* preserved.
24, 2, *for* most given *read* not given.

ATLANTIC JOURNAL,

AND

FRIEND OF KNOWLEDGE;

A CYCLOPEDIC JOURNAL AND REVIEW

OF UNIVERSAL SCIENCE AND KNOWLEDGE:—HISTORICAL, NATURAL, AND MEDICAL ARTS AND SCIENCES:—INDUSTRY, AGRICULTURE, EDUCATION AND EVERY KIND OF USEFUL INFORMATION:

WITH NUMEROUS FIGURES.

EDITOR, C. S. RAFINESQUE,
Professor of Historical and Natural Sciences, &c.

VOL. I.] PHILADELPHIA, SUMMER OF 1832. [No. 2.

Knowledge is the mental food of man.

1. ARTICLE.

CHEAP BOOKS.

BOOKS are the vehicles of knowledge. The cheaper books are, the more accessible and diffusible becomes the knowledge which they convey.

Before printing was invented, manuscripts were few and costly, knowledge scanty and limited. Since printed books have become common, knowledge has increased 100 fold, libraries have multiplied, and mankind have acquired new means of enjoyment, of happiness, and mental attainments.

But books which had been rather cheap 100 years ago, had within 50 years become again very dear, owing to a fanciful luxury in paper, embellishments, and splendid bindings. This was one of the means, partly contrived by the oligarchy of knowledge, to exclude the people or bulk of mankind from the acquirement of knowledge.

Happily however since the beginning of this century, by the enlightened enterprize of some friends of mankind and the invention of stereotype printing, both arisen in France, a new era has begun in printing and producing again very cheap books; without precluding embellishments: which the restoration of wood engraving and the invention of lithography, have enabled to add at a cheap rate.

This new system, which promises such happy results for the gradual and universal spreading of knowledge, has lately been adopted also in Germany, England and America. But unfortunately chiefly applied (as at the discovery of printing) to restore or reprint old books, rather than producing new works. But some useful compilations, libraries of knowledge, manuals, &c. have been produced accessible to all the classes of the people.

It is a positive fact that in general mental acquirements and public happiness, are now every where in proportion to the average price of books, and the facility, or cheapness of this manufacture of knowledge! of this fact the following table may be a proof.

Average price of books in retail.	Vol. 8vo. of 400 pages.	Vol. 18mo. of 200 p.
Before printing was invented, towards 1400,	$100.00	$25.00
Towards 1700,	1.00	0.25
Towards 1800, in England,	5.00	1.00
in France,	1.50	0.50
In 1830.		
In England,	3.00	0.75
In the U. States,	2.00	0.50
In Germany,	1.25	0.25
In France,	1.00	0.20

Therefore in France where books are the cheapest, the people are the most enlightened, and they stand at the head of the actual civilization of polished nations.

But why could not the same prices and results be attainable with us? A great fall in the price of printing and paper has happened within

15 years, all the prices have fallen from 25 to 50 per cent, even for Stereotyping.—Engraving alone in all its branches is yet too costly, wood engraving more so than even in England, for lack of engravers. We advise 100 of the wood engravers of England, who work at two shillings a day to come here. Notwithstanding, some useful and cheap works ornamented with wood engravings have been published, such are Professor Nuttall's Birds, and Professor Rafinesque's Medical Flora.

The high duties and taxes on paper are also another evil; notwithstanding the fall in prices, paper could be imported for our periodical press and books from Germany, France and Italy at one half the actual cost, if our duties were not prohibitory and a shameful tax on knowledge.

Our publishers who have capital, employ it chiefly in reprinting English books, to avoid paying copyrights. They steal English knowledge, and cramp with it American genius. When these impediments will be removed we can print here as cheap as in France, and send the productions of our press all over the world, as the French now do theirs: besides improving ourselves.

BENJ. FRANKLIN, junr.

2. PHILOLOGY.

Second Letter to Mr. CHAMPOLLION *on the Graphic Systems of America, and the Glyphs of* OTOLUM *or* PALENQUE, *in Central America.*—ELEMENTS OF THE GLYPHS.

I have the pleasure to present you hereto annexed, a tabular and comparitive view of the Atlantic alphabets of the 2 Continents, with a specimen of the Groups of Letters or Glyphs of the monuments of Otolum or Palenque: which belong to my 7th series of graphic signs, and are in fact words formed by grouped letters [illegible] as in Chinese Characters or Elements [illegible] like the cyphers ters; or somewhat [illegible] med by now yet in use among us, [illegible] acrostical anagrams or combinations of the first letters of words or [illegible] es.

When I began my investigation of these American Glyphs, and became convinced that they must have been groups of letters, I sought for the Elementary Letters in all the ancient known alphabets, the Chinese Sanscrit and Egyptian above all; but in vain. The Chinese characters offered but few similarities with these glyphs, and not having a literal but syllabic alphabet, could not promise the needful clue. The Sanscrit alphabet and all its derived branches, including even the Hebrew, Phenician, Pelagic, Celtic and Cantabrian alphabets were totally unlike in forms and combinations of grouping. But in the great variety of Egyptians form of the same letters, I thought that I could trace some resemblance with our American Glyphs. In fact I could see in them the Egyptian Cross, Snake, Circle, Delta, Square, Trident, Eye, Feather, Fish, Hand, &c. but sought in vain for the Birds, Lions, Sphynx, Beetle, and 100 other nameless signs of Egypt.

However, this first examination and approximation of analogy in Egypt and Africa was a great preliminary step in the enquiry. I had always believed that the Atlantes of Africa have partly colonized America, as so many ancient writers have affirmed; this belief led me to search for any preserved fragments of the alphabets of Western Africa, and Lybia, the land of the African Atlantes yet existing under the names of Berbers, Tuarics, Shelluhs &c. This was no easy task, the Atlantic antiquities are still more obscure than the Egyptian. No Champollion had raised their veil; the city of Farawan, the Thebes of the Atlantes, whose splendid ruins exist as yet in the Mountains of Atlas, has not even been described properly as yet, nor its inscriptions delineated.

However I found at last in Gramay (Africa Illustrata) an old Lybian alphabet, which has been copied by Purchas in his collection of old [illegible]abets. I was delighted to [illegible]plicit, so well connected alph[illegible]

with the Egyptian, being also an Acrostic Alphabet, and above all to find that all its signs were to be seen in the Glyphs of Otolum. Soon after appeared in a supplement to Claperton and Denham's travels in Africa, another old and obsolete Lybian alphabet, not acrostical, found by Denham in old inscriptions among the Tuarics of Targih and Ghraat west of Fezan: which although unlike the first had yet many analogies, and also with the American glyphs.

Thinking then that I had found the primitive elements of these glyphs, I hastened to communicate this important fact to Mr. Duponceau (in a printed letter directed to him in 1828) who was struck with the analogy, and was ready to confess that the glyphs of Palenque, might be alphabetical words; although he did not believe before that any American alphabets were extant. But he could not pursue my connection of ideas, analogies of signs, languages and traditions, to the extent which I desired and now am able to prove.

To render my conclusions perspicuous, I must divide the subject into several parts: directing my enquiries 1st. on the old Lybian alphabet. 2dly. On the Tuaric alphabet. 3dly. On their elements in the American glyphs. 4thly. On the possibility to read them. While the examination of their language in connection with the other Atlantic languages, will be the theme of my third letter.

I. The old Lybian delineated in the Table No. 1, has all the appearance of a very ancient alphabet, based upon the acrostical plan of Egypt; but in a very different language, of which we have 16 words preserved. This language may have been that of a branch of Atlantes, perhaps the Getulians (GE-TULA, or Tulas of the plains) or of the Ammonians, Old Lybians, and also Atlantes.

Out of these 16 words, only 5 have a slight affinity with the Egyptian, they are

Nose	Ifr. L.	Nif. E.
Sea	Mah	Mauh.
Saturn	Siash	Sev.
Venus	Uaf	Ath.
Ear	Aips	Ap.

While this Lybian has a greater analogy with the Pelagic dialects, as many as 12 out of 16 being consimilar.

Eye	Esh L.	Eshas P.
Nose	Ifr	Rinif.
Hand	Vuld	Hul, Chil.
Earth	Lambd	Landa.
Sea	Mah	Marah.
Fire	Rash	Purah.
Moon	Cek	Selka, Kres.
Mars	Dor	Hares, Thor.
Mercury	Goreg	Mergor.
Venus	Uaf	Uenas.
Saturn	Siash	Satur, Shiva.
Jupiter	Theue	Theos.

Therefore the numerical analogy is only 32 per cent with the Egyptian, while it is 75 per cent. with the Pelagic. Another proof among many that the ancient Atlantes were intimately connected with the Pelagian nations of Greece, Italy, and Spain; but much less so with the Egyptians from whom they however borrowed perhaps their graphic system.

This system is very remarkable. 1. By its acrostic form. 2. By having only 16 letters like most of the primitive alphabets, but unlike the Egyptian and Sanscrit. 3. By being susceptible of 22 sounds by modification of 6 of the letters, as usual among the Pelagian and Etruscan. 6. Above all by being based upon the acrostics of 3 important series of physical objects, the 5 senses represented by their agents in man, the 4 elements of nature and the 7 planets: which are very philosophical ideas, and must have originated in a civilized nation and learned priesthood. 5. By the graphic signs being also rude delineations of these

physical objects or their emblems. The ear, eye, nose, tongue and hand for the 5 senses. The triangle for the earth, fish for the sea or water, snake for the air, flame for fire. A circle for the sun, crescent for the moon, a sword for Mars, a purse for Mercury, the V for Venus, double ring for Saturn, and trident for Jupiter. Venus being the 5th planet has nearly the same sign as U the 5th letter.

These physical emblems are so natural and obvious, that they are sometimes found among many of the ancient alphabets; the sun and moon even among the Chinese. But in the Egyptian alphabets, the emblems apply very often to different letters, owing to the difference of language and acrostic feature. Thus the hand applies to D in Egyptian instead of U, the eye to R, the circle to O, the snake to L, &c.

II. The second Lybian alphabet No. 2, in the Tables, was the ancient alphabet of Tuarics, a modern branch of the Atlantes, until superseded by the Arabic. Denham found with some difficulty its import, and names of letters which are not acrostic but literal, and 18 in number. It is doubtful whether these names were well applied in all instances, as the explainer was ignorant and Denham not aware of the importance of this alphabet. Some appear not well named and U with V have the same sign W; but these are always interchangeable in old language, and in alphabet No. 1 V is called UAF instead of VAF, and U is VULD instead of UULD!

As we have it, this alphabet is sufficiently and obviously derived from the First, 11 out of the 16 letters being similar or nearly so, while only 5 are different, E, M, R, G and Z. This last appears the substitute of TH, of No. 1, and GH represents G. Yet they are by far more alike than the Demotic is from the Hieratic Egyptian, and I therefore deem this No. 2 a Demotic form of the ancient Lybian or Atlantic.

I might have given and compared several other Lybian alphabets found in inscriptions; but as they have been delineated without a key nor names, it is at present very difficult to decypher them. I however recommend them to the attention of the learned, and among others, point out the Lybian inscription of Apollonia, the harbour of Cyrene, given by Lacella in his travels in the Cyrenaica. The letters of this inscription appear more numerous than 16 or even 22, and although they have some analogies with the 2 Lybian alphabets, yet approximate still more to the Demotic of Egypt and the Phenician. But the inscriptions in Mount Atlas and at Farawan, when collected and decyphered, will be found of much greater historical importance.

III. Meantime in the column No. 3 of the tabular view are given 46 Elements of the Glyphs of Otolum or Palenque, a few of these glyphs being given also in column No. 4. These 46 elements are altogether similar or derived from the Lybian prototypes of No. 1 and 2. In some cases they are absolutely identic, and the conviction of their common origin is almost complete, particularly when taken in connection with the collateral proofs of traditions and languages. These elements are somewhat involved in the grouping, yet they may easily be perceived and separated. Sometimes they are ornamented by double lines or otherwise, as monumental letters often are. Sometimes united to outside numbers represented by long ellipses meaning 10 and round dots meaning unities, which approximates to the Mexican system of graphic numeration. Besides these 46 elements, some others may be seen in the glyphs, which I left off, because too intricate; although they appear reducible if a larger table could have been given. There is hardly a single one that may not be traced to these forms, or that baffles the actual theory. Therefore the conclusion must occur, that such astonishing coincidence cannot

be casual, but it is the result of original derivation.

The following remarks are of some importance.

1. The glyphs of Otolum are written from top to bottom, like the Chinese, or from side to side indifferently like the Egyptian and the Demotic Lybian of No. 2. We are not told how No. 1 was written, but probably in the same way. Several signs were used for the same letter as in Egypt.

2. Although the most common way of writing the groups is in rows and each group separated, yet we find some framed as it were in oblong squares or tablets like those of Egypt. See plate 12 of the work on Palenque by Delrio and Cabrera. In that 12th plate there are also some singular groups resembling our musical notes; could they be emblems of songs or hymns?

3. The letter represented by a head occurs frequently; but it is remarkable that the features are very different from those of the remarkable race of men or heroes delineated in the sculptures.

4. In reducing these elements to the alphabetical form, I have been guided by the mere plausible theory evolved by similar forms. We have not here the more certain demonstration of Bilingual inscriptions; but if languages should uphold this theory, the certainty will be increased of the Atlantic origins of Otolum.

IV. But shall we be able to read these glyphs and inscriptions? without positively knowing in what language they were written! The attempt will be arduous, but is not impossible. In Egypt, the Coptic has been found such a close dialect of the Egyptian, that it has enabled you to read the oldest hieroglyphs. We find among the ancient dialects of Chiapa, Yucatan and Guatimala, the branches of the ancient speech of Otolum. Nay, Otolum was perhaps the ancient TOL or TOLA, seat of the Toltecas (people of Tol) and their empire; but this subject will belong to my third letter. I will now merely give a few attempts to read some of the groups. For instance.

1. The group or word on the seat of the sitting man of plate 4 of monuments of Palenque, I read UOBAC being formed by a hand, a tongue, a circle, an ear and a crescent. It is perhaps his name. And underneath the seat is an eye with a small circle inside meaning EB.

2. In plate 5, is an eye with 2 annexed rings, meaning probably BAB, and perhaps the Sun, which is BAP in the Lybian alphabet.

3. In plate 7, the glyph of the corner with a head, a fish and a crescent means probably KIM.

4. The 1st glyph of plate 15, is probably BALKE.

5. I can make out many others, reading ICBE, BOCOGO, POPO, EPL, PKE, &c.

If these words and others (although some may be names) can be found in African languages, or in those of Central America, we shall obtain perhaps the key to the whole language of Old Otolum. And next reach step by step to the desirable knowledge of reading these glyphs, which may cover much historical knowledge of high import. Meantime I have open the path, if my theory and conjectures are correct, as I have strong reasons to believe.

Besides this monumental alphabet, the same nation that built Otolum, had a Demotic alphabet belonging to my 8th series; which was found in Guatimala and Yucatan at the Spanish conquest. A specimen of it has been given by Humboldt in his American Researches, plate 45, from the Dresden Library, and has been ascertained to be Guatimalan instead of Mexican, being totally unlike the Mexican pictorial manuscripts. This page of Demotic has letters and numbers, these represented by strokes meaning 5 and dots meaning unities, as the dots never exceed 4. This is nearly similar to the monumental numbers.

The words are much less handsome than the monumental glyphs; they are also uncouth glyphs in rows formed by irregular or flexuous heavy strokes, inclosing within in small strokes, nearly the same letters as in the monuments. It might not be impossible to decypher some of these manuscripts written on metl paper: since they are written in languages yet spoken, and the writing was understood in Central America, as late as 200 years ago. If this is done it will be the best clue to the monumental inscriptions.

C. S. Rafinesque.

Philadelphia, February, 1832.

Note.—While this letter is going to press, we hear of the death of the learned Champollion, a great loss to sciences and erudition. The 3 letters directed to him were written in January, February and March of this year, while his career of usefulness was yet unimpaired; but they were as much intended for the learned all over the world, as for himself, and therefore were printed instead of being sent. The third which is to appear in the next number, will however be inscribed to Klaproth as a substitute.

We have lately heard that the 1st number of 3 excursions to Mitla and Palenque, performed in 1805 to 1807, by Capt. Depaix, has lately been published in Paris under the title of Mexican Antiquities; but it has not reached us.

3. Primitive Origin of the English Language.

The best work on the philosophy and affinities of the English language is at present, the Introduction by Noah Webster, to his great Dictionary. Yet although he has taken enlarged views of the subject, and by far surpassed every predecessor, he has left much to do to those future philologists and philosophers who may be inclined to pursue the subject still further: not having traced the English language to its primitive sources, nor through all its variations and anomalies.

But no very speedy addition to this knowledge is likely to be produced, since Mr. Webster has stated in a letter inserted in the Genesee Farmer of March 1832, (written to vindicate some of his improvements in Orthography) that no one has been found in America nor England able to review his introduction! although many have been applied to! But I was not one of those; few knowing of my immense researches in languages, I was not consulted, else I could have done ample justice to the subject and Mr. Webster.

It is not now a review of his labours that I undertake, but merely an enquiry into the primitive origin of our language, extracted from my manuscript philosophy of the English, French and Italian languages compared with all the other languages or dialects of the whole world, not less than 3000 in number!

The modern English has really only one immediate parent. The *Old English*, such as it was spoken and written in England between the years 1000 and 1500, lasting about 500 years, which is the usual duration of fluctuating languages. Our actual English is a natural deviation or dialect of it, begun between 1475 and 1525, and gradually improved and polished under two different forms, the written English and the spoken English, which are as different from each other as the English from the French. These two forms have received great accession, by the increase of knowledge and borrowing from many akin languages, words unknown to the Old English. They are both subject yet to fluctuations of orthography and pronunciation, which gradually modify them again.

The Old English existed probably also under these two forms, and had several contemporaneous dialects, as the modern English, of which the Yorkshire and Scotch dialects are most striking in Europe, while the

Guyana Creole and West India Creole, are the most remarkable in America. Another dialect filled with Bengali and Hindostani words is also forming in the East Indies.

A complete comparison of the old and modern English has not yet been given. A few striking examples will here be inserted as a specimen of disparity.

Written Old E.	Written Mod. E.	Spoken Mod. E.
Londe	Land	Land.
Sterre	Star	Star.
Erthe	Earth	Erth.
Yle	Island	Ailend.
See	Sea	Si.
Benethen	Beneath	Binith.
Hewyn	Heaven	Hev'n.
Hedde	Head	Hed.

As late as the year 1555, we find the English language very different from the actual, at least in orthography, for instance—

Eng. of 1555.	Written Mod. E.	Spoken Mod. E.
Preste	Priest	Prist.
Euyll	Evil	Ivl.
Youe	You	Yu.
Fyer	Fire	Fayer.
Howse	House	Laus.

This old English is supposed to have sprung from the amalgamation of 3 languages, 1. British-Celtic. 2. Anglo-Saxon and Norman-French, between the years 1000 and 1200. This has been well proved by many and I take it for granted.

But the successive parents and the genealogies of the Celtic, Saxon and Norman, are not so well understood. Yet through their successive and gradual dialects springing from each other, are to be traced the anomalies and affinities of all the modern languages of Western Europe.

By this investigation it is found that these 3 parents of the English, instead of being remote and distinct languages, were themselves brothers, sprung from a common primitive source, having undergone fluctuations and changes every 500 or 1000 years. For instance, the Latin of the time of Romulus was quite a different language from that spoken in the time of Augustus, altho' this was the child of the former, this of the Ausonian, &c.

The following table will illustrate this fact, and the subsequent remarks prove it.

I. Old English sprung partly from the British Celtic.

2d Step. British Celtic of Great Brittain sprung from the Celtic of West Europe,

3d Step. This Celtic from the Cumric or Kimran of Europe.

4th Step. The Cumric from the Gomerian of Western Asia.

5th Step. The Gomerian from the Yavana of Central Asia.

6th Step. The Yavana was a dialect of the Sanscrit.

II. Source. The Old English partly sprung from the Anglo-Saxon of Brittain.

2d Step. The Anglo-Saxon sprung from Saxon or Sacasenas of Germany.

3d Step. The Saxon from the Teutonic or Gothic of Europe.

4th Step. The Teutonic from the Getic of East Europe.

5th Step. The Getic from the Tiras or Tharaca of West Asia. (Thracians of the Greeks.)

6th Step. The Tiras from the Cutic or Saca of Central Asia, called Scythian by the Greeks.

7th Step. The Saca was a branch of the SANSCRIT!

III. Source. Old English partly sprung from the Norman French.

2d Step. The Norman French was sprung from the Romanic of France.

3d Step. The Romanic from the Celtic, Teutonic and Roman Latin.

4th Step. The Roman Latin from the Latin of Romulus.

5th Step. The Latin from the Ausonian of Italy.

6th Step. The Ausonian from the Pelagic of Greece and West Asia.

7th Step. The Pelagic from the Palangsha or Pali of Central Asia.

8th. The Pali was a branch of the SANSCRIT!

Thus we see all these sources of the English language concentrating by gradual steps into the SANSCRIT, one of the oldest languages of Central Asia, which has spread its branches all over the globe. Being the original language of that race of men, fathers of the Hindus, Persians, Europeans, and Polynesians.

All the affinities between English and Sanscrit, are direct and striking, notwithstanding many deviations and lapse of ages. While those between the English and other primitive languages, such as Chinese, Mongol, Arabic, Hebrew, Coptic, Berler, &c. are much less in number and importance; being probably derived from the natural primitive analogy of those languages with the Sanscrit itself, when all the languages in Asia, were intimately connected.

Many authors have studied and unfolded the English analogies with many languages; but few if any have ever stated their numerical amount. Unless this is done we can never ascertain the relative amount of mutual affinities. It would be a very laborious and tedious task to count those enumerated in Webster's Dictionary. My numerical rule affords a very easy mode to calculate this amount without much trouble.

Thus to find the amount of affinities between English and Latin, let us take 10 important words at random in each.

Wr. Eng.	Sp. Eng.	Latin.
Woman	Vumehn	Femina.
†† Water	Vuater	Aqua.
† Earth	Erth	Terra.
† God	God	Deus.
†† Soul	Sol	Anima.
One	Uahn	Unum.
†† House	Haus	Domus.
† Moon	Muhn	Luna
Star	Star	Aster.
†† Good	Gud	Bonus.

We thereby find 3 affinities in 10 or 30 per cent. as many analogies or semi affinities marked † equal to 15 per cent. more, and 4 words or 40 per cent. have no affinities. This will probably be found a fair average of the mutual rate in the Old English; but the modern has received so many Latin synonyms as to exceed perhaps this rate.

Of these analogies, it is remarkable, that most are not direct from the Latin, or even through the French; but are of Saxon origin, which had them with the Latin previously.

Thus the affinities between the English and Greek or Russian, are derived through the Pelagic and Thracian, unless lately adopted.

Boxhorn and Lipsius first noticed the great affinities of words and grammar between the Persian and German dialects: 25 German writers have written on this. But Weston in a very rare work printed at Calcutta in 1816, on the conformity of the English and European languages with the Persian, has much enlarged the subject, and has given as many as 480 consimilar words between Persian and Latin, Greek, English, Gothic, and Celtic; but he has not stated the numerical amount of these affinities. All this is not surprising since the Iranians or Persians were also a branch of Hindus, and this language a child of the Zend, a dialect of the Sanscrit. Hammer has found as many as 560 affinities between German and Persian.

But the late work of Col. Kennedy, Researches on the origin and affinity of the principal languages of Asia and Europe, London, 1828, 4to. is the most important as directly concerning this investigation; notwithstanding that he has ventured on several gratuitous assertions; and has many omissions of consequence.

Kennedy states that the Sanscrit has 2500 verbal roots, but only 566 have distinct meanings; while each admitting of 25 suffixes they form 60,000 words, and as they are susceptible of 958 increments, as many as 1,395,000 words may be said to exist in this wonderful language.

Yet out of these 2500 roots, as many as 900 are found by Kennedy

in the Persian and European languages, although the Greek has only 2200 roots and the Latin 2400. Of these 900 affinities

339 are found in the Greek
319 in Latin
265 in Persian
262 in German
251 in English
527 in Greek or Latin
181 in both German and English
31 in all the 5 languages.

This is something positive and numerical; but unfortunately not definite, and partly erroneous, as will be proved presently for the English. Kennedy denies affinities between the Celtic and Sanscrit, but the very words he has offered as examples (only 100) offer many evident affinities. His opinion that the Hindus and Egyptians came from the Babylonians is very improbable. It was from the high table land of Central Asia that all the old nations came.

The 251 English affinities may be seen in Kennedy, as well as the 339 Latin, which are mostly found now also in English through the words derived from the Latin. These two united would be 590 or more already than the 566 separate meanings of the Sanscrit roots. But Kennedy has by no means exhausted the Sanscrit etymologies of the English. Although I have no English Sanscrit dictionary at hand, yet I have many Sanscrit vocabularies, where I find many words omitted by Kennedy. And what is not found in the Sanscrit itself is found in its Eastern children the modern languages of Hindostan.

Among my vocabularies, the most important is one made by myself of the principal words of the old Sanscrit met with and explained in the laws of Menu translated by Jones. In these old and often obsolete words are found the most striking affinities of which I here give the greater part.

English.		Old Sanscrit
Written.	Spoken.	of Menu.
Mother	Mother	Mara.
Mind	Maind	Men.
Mankind	Mehnkaind	Manavah.
Era	Ira	Antara.
Hour	Hauer	Hora.
Virtuous	Værtius	Verta.
Antique	Antic	Arti.
Beetle	Bitl	Blatta.
Penny	Peni	Pana.
Gas	Gas	Akasa.
Father	Father	Vasus.
Play	Ple	Waya.
Malice (sin)	Malis	Mala.
Patriarch	Patriark	Patri.
Middle	Midl	Medhya.
Teacher	Ticher	Acharya.
Bos (master)	Bos	Bhos.
Before	Bifor	Purva.
Wind	Vuind	Pavana.
Deity	Deiti	Daitya.
Mouth	Mauth	Muc'ha.
Eyes	Aiz	Eshas.
Right	Rait	Rita.
Phantom	Fantom	Vantasa.
Wood	Vud	Venu.
Me, mine	Mi, maihn	Man.
Animate	Animet	Mahat.
Spirit	Spirit	Eshetra.

Being 28 derivated words out of 84 of this old vocabulary. 33 per ct.

Another very singular vocabulary I have extracted from the Transactions of the Literary Society of Bombay, and Erskine's Account of the Ancient Mahabad Religion of Balk from the book Desatir. Some words are given there of the language of the Mahabad empire, the primitive Iran, which appears to be a very early dialect of the Sanscrit and Zend. Out of 30 words 12 have analogies to the English, equal to 40 per cent.

English.		Mahabad
Written.	Spoken.	of Iran.
Father	Father	Fiter.
End	End	Antan.
Course	Kors	Kur (time)
Nigh	Nay	Unim.

Amical	Amikal	Mitr (friend)
Globe	Glob	Gul.
Middle	Midl	Mad.
Sky	Skay	Kas.
Royal	Royal	Raka (king)
Ignate	Ignet	Agai (fire)
Man	Mehn	Minhush.
Donation	Doneshiohn	Datisur.

I could add here at least 250 to the 251 of Kennedy, if it were not too tedious and long. But I can safely vouch that all the 566 radical roots of peculiar meaning, forming the base of the Sanscrit, are to be found in the English roots, or if a few are lacking it is merely owing to some having become obsolete through the lapse of nearly 5000 years, when the Yavanas, Sacas and Pallis separated from their Hindu brethren, and the revolution of 6 or 7 successive dialects formed by each, till they met again in the English.

Kennedy has even some obsolete English and Scotch words, now out of use, which are derived from the Sanscrit.

This enquiry is not merely useful to unfold the origin and revolutions of our language; but it applies more or less to all the languages of Europe: which were formed in a similar way by dialects of former languages. Since every dialect becomes a language whenever it is widely spread and cultivated by a polished nation. Thus the French, Italian, Spanish, Portuguese, Romanic and Valaquian are now become languages with new dialects of their own, although they are in fact mere dialects of the Latin and Celtic.

The physical conformation and features of all the European and Hindu nations are well known to agree, and naturalists consider them as a common race. The historical traditions of these nations confirm the philological and physical evidence. All the European nations came from the East or the West of the Imaus table land of Asia, the seat of the ancient Hindu empires of Balk, Cashmir and Iran. The order of time in which the Asiatic nations entered Europe to colonize it was as follows, 1 or most ancient.

1. *Esquas* or *Oscans* or *Iberians* or *Cantabrians.*

2. Gomarians or Cumras or Celts or Gaels.

3. Getes or Goths or Scutans or Scythians.

4. Finns or Laps or Sames.

5. Tiras or Thracians, or Illyrians or Slaves.

6. Pallis or Pelasgians or Hellenes or Greeks.

The settlement in Europe of these last is so remote as to be involved in obscurity. But their geographical positions, traditions and languages prove their relative antiquity. The Greek language is one of those that has been most permanent, having lasted 2500 years from Homer's time to the Turkish conquest. Yet it sprung trom the Pelagic and has given birth to the Romaic or modern Greek dialects. C. S. R.

4. ANTHROPOLOGY.

The Fundamental Base of the Philosophy of Human Speech, or Philology and Ethnology.

By C. S. Rafinesque.

The natural history of man and mankind includes so many branches, that some of them have been deemed worthy of the proud title of separate sciences. Such are *Philology* or the science of human speech and languages, with *Ethnology* or the knowledge of nations of a same speech, which are so intimately connected that they can hardly be separated. Ethnology is a very modern science, even later than Geology, and as yet hardly known in America, although much cultivated latterly in Germany and France, being considered an indispensable auxiliary to history and geography.

Horne Tooke has long ago said that *languages cannot lie;* and the most eminent linguists have all

adopted that opinion. Comparative Philology has always confirmed it. The results of the most extensive researches have proved,

I. That words are the elements of languages.

2. That the names given to the most common and obvious objects are their first elements, and the least subject to variations.

3. That words resembling each other more or less are the links uniting the dialects and languages, into groups or clusters.

4. That these words must be such as apply to the same objects, or are synonymous in many cases.

5. That Syntax and Grammar or the modes in which words are modified and combined are subservient to the radical or elementary words, and thus of much less relative importance.

To these obvious results and rules, I add three others which I have myself ascertained.

1. That a small number of these words taken almost at random in two languages or dialects, are sufficient to indicate their degree of analogy, without puzzling ourselves with comparing all the words of both, which may often be impossible.

2. That the degree of similarity, analogy or affinities between 2 or more languages ought to be expressed numerically.

3. That when needful to pursue the enquiry still further or very minutely, the deviations or variations of sounds in the compound words might be divided into 5 or 10 series of successive or combined changes, additions or elision of sounds and letters; whose numbers should express the analogy, and by a division of the total by 5 or 10, the whole numerical and strict amount of identity is ascertained.

To prove the correct principle of these rules, without enlarging much the subject, I shall merely select as an example and illustration the cardinal numbers in 2 well known languages, English and French, so as to proceed from the known to the unknown, as always desirable in science.

I have discovered and applied a strict formula to fulfil these indications, and have thus almost reduced Philology and Ethnology to a *mathematical demonstration* of combined or compound affinities. I call it the *Synoremic formula*, or the Numerical and Analogical Rule. Thus,

Problem. A number whatever of elementary words in two dialects or languages being known, to find what is their numerical degree of mutual analogy or reciprocal affinities.

Answer or *Solution.* Compare each word, count those which are alike or similar; their amount is the numerical degree of affinity when compared with the whole amount of given words.

Examples. Let 10 words be compared, if two are found similar, *the result will be* 2 in 10 = 20 per cent. If 45 words are compared and 20 found similar, the result is 20 in 45 = 44½ per cent.

Till now Philologists in comparing languages had omitted to state upon how many words they had operated. By attending to this important basis of their labours, we shall achieve a great improvement, and give a kind of mathematical certainty to the whole.

I shall not pursue now this formula upon the plan of my 3d rule, so as to find the numerical degree of *identity* of two languages, as it requires many explanations; but the mode, problem, answer and examples are upon the same principle.

Let us apply it to the cardinal numbers in English and French, remembering that these two languages are double in form, having each a written and a spoken dialect: the spoken form will be written on the principles of universal and strict phonology, as far as our letters and signs in use allow it.

Wr. E.	Sp. E.	Wr. Fr.	Sp. Fr.
One	Uahn	Un	Œn
?two	tu	deux	dœ.
three	thri	trois	trua.
†four	fuor	quatre	katr'.
†five	faiv	cinq	senk,
six	siks	six	sis.
seven	sev'n	sept	set.
eight	eit	huit	hœit.
?nine	naihn	neuf	nœf.
†ten	tehn	dix	dis.

In the 3 numbers marked † there is no affinity, in those two ? the analogy is rather remote.

Thus the English and French languages compared merely by their 10 cardinal numbers, which are a very fair scale in many languages, evince a considerable analogy of 7 in 10 equal to 70 per cent. But if the numbers 2 and 9 with remote analogies are only reckoned for 1, it is reduced to 6 in 10 = 60 per cent. While by the formula of identity, it is still further reduced to 42 in 100 or 42 per cent. of positive identity, derived from the 3 parents of both languages, the Celtic, Teutonic and Latin.

I have been led to this enquiry and mode of investigation, by the wish of finding the affinities and origins of the American nations and languages, which many superficial examiners had pronounced to be involved in total obscurity and impossible to classify, but I have not found them so: by my formula all evince their mutual analogies, whose calculable amount enables us to classify them.

Having further extended this process to many doubtful languages of Africa and elsewhere, and having even compared 3 languages with all the others known, 1. English. 2. Taino or Haytian. 3. Samang of the Asiatic Negros of Malaca; I have come to the surprising and unexpected result, *That all the languages have a greater or lesser affinity with all the other languages;* which fact although it may have been surmised had never been proved, but which can now be proved mathematically. Whence flows another very important category or rule.

That languages and nations are no longer to be classed or connected by insulated or limited analogies; but by the numerical amount of their total affinities with each of all the other languages.

This will be found a great step in the historical knowledge of mankind, evolved from the most solid and evident philological proofs. These facts were already partly announced by me in 1824 and 1828, and I can now add that I have thereby confirmed the unity of mankind: since even the negro languages have preserved the indications of their common origin.

In all the American languages I have found the greatest analogies with the Sanscrit, Caucasian, Arab, Mongol, Samoyed and Chinese of Asia. The Copt, Berber, Jolof, Congo, &c. of Africa. The Celtic, Cantabrian, Latin and Greek of Europe. And even the Malay, Tagala, Japanese, Haway, &c. of Polynesia, amounting in some instances to 50, 60, and 70 per cent. of analogy, or from 30 to 60 per cent. of identity.

I shall conclude by giving one instance of these numerous analogies in the Taino of Hayti, Cuba, Jamaica in 1492 and the Guanche of the Canary Islands, now both extinct.

The number of words to be compared was 32, and the followiug 14 are analogous.

English.	Haytian.	Guanche.
God	Yocahuna Maocon Guamochyna	Corac. Achaman. Achicanac.
Devil	Tuyra	Yurena.
Land	Caya, Xaya Acan, Cati	Haave. Kaa.

English.	Haytian.	Guanch.
Priest	Bohito, Boition Behique, Buhui	Faybo. Faycan.
Man	Guani, Cani	Guanch.
Mother	Mama	Mama, Ima.
Corn	Mahiz	Tamozen.
Boat	Canoa, Pagay	Guyon.
Water	Ama, Xama	Hamen, Acmun.
Milk, Breast	Toa	Aho.
Club, Sword	Macana	Masacas.
Good	Taino, Guatayo	Antha, Makay.
Dog	Cuchis, Gochis	Cuna, Cuncha.
Hog, Swine	Zaino	Taguazen.

Thus the Haytian a dialect of the Aruac spreading from Florida to Brazil, and the Guanch the nearest African dialect of the Atlantic or Berber language spreading from the Atlas to Nubia, have 14 in 32 of mutual affinity, equal to 44 per ct.; which indicates that they were dialects of two akin languages, spoken by two nations that were akin at a period unknown.

Thus a clue is at last afforded to American origins, much more certain than all the previous and numberless theories on the subject. And a solid basis is acquired to build upon, in any future researches and investigation of American origins and history. Klaproth has asserted, and this historical model of research will prove, that languages are even of more importance than features and complexion to distinguish or assimilate human families: thus the speech of man, peculiar to him, shall be found to take the lead even of physical forms and deviations.

Philadelphia, May 1831.

5. AMERICAN HISTORY.

ON THE ZAPOTECAS

And other Tribes of the State of Oaxaca.

By C. S. Rafinesque.

It is to be regretted that the author of the notice on the Zapotecas of Oaxaca and their temple of Mictla, inserted in the September No. of the Journal of Geology, has remained anonymous: having stated some new historical facts, he ought to have given his name, since he has quoted no authority. For instance to what author had he access to for the names of the two last kings of the Zapotecas, *Cosi-foeza* and *Cosi-xopu?* when did they cease to rule and is there a longer list of these kings?

Some account of these kings and their deeds, as well as the Zapoteca language, which is hardly known, would have been more acceptable to the learned than the notice on Mictla, called Mitla by Humboldt, and already described by him with a figure. Even the true name of the Zapotecas in their own language is unknown, that name being merely a nickname given them by their foes the Aztecas or Mexicans: it means *Apple-people, Tecas* (*people*) and *Zapo* or *Zapotl* a generic name for apples. (Tl added to words answers in Azteca to our article *the.*) It is by these nicknames that the American tribes have been disfigured and swelled beyond truth. The first enquiry in their history is to ascertain their true national name, which is often no easy task.

My authorities for the following account are, Herrera's History of Spanish America from 1492 to 1554, Garcia's Origen delos Indios, Laet, Clavigero, Humboldt, Diaz, Vater, Siguenza, Acosta, Torquemada, Touron, Alcedo, &c.

Oaxaca is a fine province (now

State) south of Veracruz and S. E. of Mexico; it was formed in 1580 by the union of the 2 provinces of Zapotecas and Miztecas: the name being given by the city of Guaxaca, formerly Huacxyacac and now softened into Oaxaca, capital of the estate of Cortez, who was made Marquis of Guaxaca in reward of his conquest or rather invasion of Mexico.

The Miztecas dwelt between the Zapotecas and Mexico; they were a fierce nation, yet at war with the Spaniards and Zapotecas in 1572, and only subdued between 1572 and 1580 (Laet). Their name has been spelt also Mixtecas, Mictec, Mixes, Mixos, Micos, Mecos, Miges, &c. All these names, leaving off *tecas* which means people, imply Lion or rather Cuguar, are animal of the tiger genus, which was the emblem or progenitor of the nation (*Miz* tiger genus in Azteca.) But the Mexicans changed it by contempt probably into *Mic*, *Mix*, or *Mec*, a single word meaning 4 things in Azteca, which are connected in the language, 1. North, 2. Hell, 3. Devil, 4. Apes. This is evidently the root of *Mictla*, *tla* being the article or an abbreviation of *tlan* a place.

It is by this apparently trivial examen and etymology that I have come to the important conclusion that the Miztecas and Zapotecas are the modern remains of the ancient nations of Olmecas and Xicallancas, mentioned in Mexican history as anterior to the Toltecas in Anahuac; and that the *Otomis* and *Chichimecas* were also consimilar tribes. Here it will be needful to refer to ancient traditions, which are not all lost. Although Zumaraga, first bishop of Mexico, and extolled for his zeal by the monks, behaved in Mexico as Omar had done in Egypt, by burning the libraries of Tezcuco, the Athens of Anahuac, (those of Mexico itself had been lost in the siege) he could not destroy all the books scattered through the whole of Anahuac. Many are yet extant, Herrera and Garcias have given some of the traditions of the Zapotecas and Miztecas, neglected by Clavigero and Humboldt. An English Lord has lately published a splendid work on some Mexican Antiquities and manuscripts. The Library of the Philosophical Society of Philadelphia, has the fac simile of an Azteca manuscript which I have decyphered.

The Zapotecas boast of being antidiluvian in America, to have built the city of *Coatlan* (snake place in Azteca) 327 years before the flood, and to have escaped the flood with their king *Petela* (Dog) on the mountain of Coatlan (Garcias.) Which of the two floods of the Aztecas this was, whether that of *Xelhua* or of *Coxcox* is hard to say. The Petela or Dog dynasty ruled over them ever since till the Spanish conquest.

The Coatlatecas (snake people) or Cuitlatecas, the Cuycatecas (singing people) or Cuiscatecas, and the Popaloavas are tribes of Zapotecas, speaking dialects of the same language, of which Clavigero says there is a grammar, but Vater has not given any words of it. I have been able to collect only 12 words of it out of 6 authors.

God or Creator of all things	Ahcabohuil.	
Spirit	Vinac	
House or place	Baa	*Ba* in Mizteca.
Brother	Hun	*Cuhua* do.
Dog	Petela	
Repose or Death	Lio, Leo	*Leob* do.
Heaven	Avan	*Andevui* do.
Earth	Baca	*Gnuagnuay* do.
Hell or Evil	Chevan	*Kuachi* do.
Woman	Yxca.	
Eve or first Woman	Xtmana.	
Adam or first Man	Xchmel.	

Whereby it is seen that out of 6 words which I have to compare in Mizteca 4 are similar and 2 not very different. Therefore the just conclusion is that the Mizteca and Zapoteca are also dialects of each oth-

er, or languages very nearly related. The same with the Zacatecas.

Of the Mizteca Vater has given many words; he surmises that it is very near to the Othomiz or Otomi: and he considers several other languages of Anahuac as dialects of it; they are the Zoque, Lacandone, Mame, Zeltales or Celdales, Chiapaneca, Mazateca, Chochona, besides the Mixe and Cuiscateca already mentioned. This if true would diminish the number of languages of that region and extend the Mizteca nation far to the South and East in Guatimala, as the Otomi and Chichimecas will extend it far to the North.

I have a good vocabulary before me of the Othomiz language by De Neve 1767, and although only 10 words can be found in the Mizteca of Vater, 5 of them are alike or similar, which gives 50 per cent. of mutual affinity and leaves little doubt of their primitive connection. These words are,

	(Othomiz)	(Mizteca)
Father	Hta	Dzutun
Land	Hay	Gnuagnay.
Nose	Xinu	Dztni.
Son	Batzi	Dzaya.
Bread	Thume	Dzite.

The Chichimecas (Dog devils or Northern Dogs in Aztecas) are not a nation, but this appellation was given to all the northern wild tribes and foes of the Aztecas, even to one speaking the Azteca language, and lately to many of the Apaches, Skere or Pani tribes forming a nation spread from Anahuac to Oregon and Athabasca lake, among which the Shoshonis of Oregon bear also the name of Snake Indians as yet.

In result I am led to believe that the Miztecas and Zapotecas were once with the Otomis and many others, the snake-nation of America, which did afterwards divide into the Dog and Cat tribes or Zapotecas and Miztecas. The same has happened in Asia and North America where many nations ascribe their origin to Snake-men, Dog-men and Cat-men or people.

The Olmecas or Olmec or Hulmecs of ancient Anahuac, whose name means *Old Devils* in Azteca, are said to have settled in Anahuac after the Othomiz, but with their allies the Xicallaneas or Xicayans, whose name we may recognise in the Cuycatecas of modern times, and were probably the old Zapotecas, the Southern Miztecas are yet called Xicayans.

Their settlement is so ancient that it is beyond the Azteca and even Tolteca chronology. It happened after the sway of Gods, Giants and Apes (different nations.) They conquered and expelled the Giants or Titans of Anahuac called Tuinametin and Tzocuitlixeque, and took the name of Tequenes or People of Tygers. They were divided into 3 tribes, Olmecas, Xicalans and Zacatecas speaking the same language! (see Torquemada.) They came from the snowy mountains, and united for this conquest under the king Coxanatecuhtli, building many cities and ruling a long while over Anahuac.

Another tradition traces the origin of the Hulmecas to Hulmecatl brother of Xelhua, the Noah of Anahuac, and indicates several dynasties ruling successively their empire, 1. Ulmec, 2. Cochoblam, 3. Quetzalcoatl, the famous Legislator of Cholula, 4. Huemac, and ends by Colopecthtli last king killed by the Tlascalans towards 1196 of our era, who drove them to the East settling in their country. The last we hear of the Ulmecas in the Aztec history is in 1457 and 1467 when those of Cotasta on the sea shore were conquered by Montezuma I. While this name disappears from history, that of the Miztecas and Zapotecas appears in the same place or to the S. E. of Mexico, and thus the evidence is complete that they were the same nation under different names.

In 1454 the Miztecas won a great battle over the Aztecas and their al-

lies, whose real sway in Anahuac only began towards 1425 and hardly lasted one century. In 1455 Atonaltzin king of Miztecas although helped by the Tlascalans was taken and his kingdom conquered. This king is elsewhere called Yaguitlan.

The Miztecas rebelled in 1480, and in 1486 the Zapotecas resisted the whole power of Mexico. But at last became tributary; yet in 1506 and 1507 they both were at war again with Mexico.

Although overjoyed at the downfall of the Mexicans, effected by 100,000 Tlascalans and allies among which were some Miztecas, and 900 Spaniards under Cortez: they did not readily submit to the Spanish yoke and tribute after the fall of Mexico in 1521.

In 1522 the Zapotecas defeated Sandoval, and were only conquered in 1526 by Olmedo (see Diaz,) but they have often rebelled against the Spaniards. In 1572 the Miztecas were at war with the Spaniards and the Zapotecas; these had been conciliated by the mild rule of their Lord Cortez, who established only a small quit rent on land, without any forced labour: this system has made Oaxaca a flourishing city and province.

The Zapotecas and Miztecas are represented as the handsomest Indians of Mexico, nearly white, and the females are beautiful, as white as the Spanish women. This also happens in Zacatecas, a province of the former Olmecas: therefore it appears that this race is distinct from the Azteca or Mexican nation in features as well as languages: notwithstanding that some writers wrongly assert that the Olmecas spoke the same language as the Aztecas and Toltecas. The Mixes have sometimes long beards and resemble European; they are a tribe of Miztecas. Thus we find by investigation that the nations and languages of the Mexican States are as easily reduced to a small number as those of the remainder of North America.

The Theogony, Cosmogony and religion of the Miztecas and Zapotecas was also very different from the Mexicans, although they had latterly adopted their bloody rites of the god of evil. The Miztecas of Cuilapo according to a book written by a Spanish monk in the Mizteca language and figures, (preserved by Garcias) ascribe their origin to a god and goddess named *Lion Snake* and *Tyger Snake* dwelling in *Apoala* or heavenly seat of Snakes before the flood. They had two Sons (or nations) an eagle called *Wind of 9 Caves*, and a Dragon or Winged Snake called *Wind of 9 Snakes*. They were driven from *Apoala* for their wickedness and perished in a great flood. In *Apoala* we find the *Tlapala* or ancient seat of the Mexicans: which is perhaps the *Apalachi* mountains of North America, where was once the holy mountain, temple and cave of *Olaimi* (see Brigstock) which name recalls to mind the *Olmecas!* and all these names answer in import and sound to the *Olympus* of the Greeks.

The Zapotecas had similar, but more definite ideas. *Ahcabohuil* was the Creator of all things; but a divine man and divine woman *Xchmel* and *Xtmana* were the progenitors of mankind and of the 3 great gods *Avan* god of heaven, *Baca* god of earth and *Chevan* god of hell. These 3 brothers are surprizingly alike in import and names with the Trimurti or triad of the Hindus, the 3 manifestations of the Deity *Vishnu*, *Brama*, and *Shiven!*

This same triad was worshipped in Chiapa, Yucatan, Hayti and many other parts of America, under names not very unlike, such as

Izona, Vacah and Estruah in Chiapa.

Izona, Bacab and Echvah in Yucatan.

Bugia, Bradama and Aiba in Hayti.

Iao, Isnez and Suroki by the Apalachians.

Yah, Wachil and Wacki by the Natchez.

Quoyoh, Kiwas and Ocki in Virginia and Florida.

Zungua, Quexuga and Haraqui by the Chicolas.

Garronhia, Tahuisca and Oyaron by the Hurons.

Amane, Vaca and Vochi by the Tamanacs.

Akambue, Ichein and Maboya by the Caribs.

Apu, Churi and Voqui in Peru.

Pillian, Meulen and Wocuba in Chili.

Nemque, Zuhe and Bochica by the Muyzcas.

Guipanavi, Avari and Caveri by the Maipuris.

Aygnan, Tupan and Mabira in Brazil, &c.

Are not these coincidences very surprizing and interesting for the history of mankind and of their religions? They will appear still more so if we compare them with the different triads of Asia and other parts. Sometimes the Asiatic names are more dissimilar between themselves than the American, or else resemble still more some of them. A few instances will be sufficient to prove this strange fact.

Asiatic Triads.

Brimha, Vistnow and Etcheves.

Tama, Satua and Raju.

Pramih, Bichen and Sumbreh.

Angeor, Okar and Gun.

Braham, Narayan and Mahesa.

Brahima, Bala and Mahadeo.

Brumany, Ramana and Rudra.

Primah, Krishna and Iswara.

The above by the Hindus in different modern languages of India, Decan, and Indostan: which are all dialects of the Sanscrit.

Prahma, Aug and Codon in Siam and Ava.

Bahman, Homi and Barzoi of Iran.

Bahman, Manistar and Tamistar of the Mabadad.

Hum, Fo and Kya, of Thibet.

Y, Hi and Vi of the Tao religion of China.

O, Mi and To of the Fo religion of China.

Eon, Hesu and Pur of the Phrygians.

Samen, Phegor and Zebu of the Syrians.

African Triads.

Amon, Mouth and Khous of Egypt and Thebes.

Ucharan, Ahicanac and Guayota of the Guanches.

European Triads.

Olcus, Pan and Ath of the Cyclopians.

Prome, Epime and Mene of the Pelagians.

Pan, Eros and Methusa, of the Greeks.

Zeus, Poseidon and Hades of the Greeks.

Ian, Aesar, and Sancus of the Etruscans.

Ain, Aesar and Taut of the Celts.

Bram, Amen and Vix of the Oscans.

Kog, Om and Pax of the Eleusinian mysteries.

Molk, Fan and Taulas of Hibernians.

Odin, Vile and Ve of Scandinavians.

Perun, Morski and Nya of the Slavonians.

Polynesian Triads.

Biruma, Vishnu and Uritram of Ceylan.

Awun, Injo and Niwo of Japan.

Tane, Akea and Miru of Havay.

Tani, Uru and Taroa of Taiti, &c. &c.

The order of these divine manifestations is of little consequence and depends upon the priority of those mostly worshipped, whether the God of Heaven, Earth or Hell. The Hindus have now two Sects worshipping Vishnu and Shiva, but Brama has few worshippers at present.

These names would appear still more strikingly alike if they all meant the same; but they often mean

the past present and future, or power, life and death, or the rising blazing and setting of the Sun or some other consimilar ideas instead of heaven, earth and hell, although they always apply to the triple manifestations of the Deity, distinguished and personified in Creation, Preservation and Destruction. This subject which might be pursued much further, may indicate a primitive conformity of religious ideas in mankind all over the world.

Seventeen languages and dialects of Anahuac or the Mexican States are said to have been reduced to grammars and dictionaries by the Spanish missionaries; Vater and the other philologists do not appear to have known them all. In order to draw thereon the attention of those who dwell in Mexico, I shall attempt to enumerate all the Mexican dialects under 4 series, 1 well known, 2 Little known, 3 Hardly known and 4 Totally unknown to the learned and historians. It will be obvious that the 2 latter series require chiefly the attention of those who may have the opportunity to travel or dwell in Mexico.

1st Series. Languages or dialects well known of which we have ample vocabularies and grammars known to the learned—1. Azteca or true Mexican. 2. Otomi. 3. Mizteca. 4. Maya. 5. Cora. 6. Totonaca. 7. Pima. 8. Poconchi.

2d Series. Little known to the learned at least, but well known in Mexico as there are grammars &c. of them. 1. Tarasca. 2. Huasteca. 3. Yaqui. 4. Popoluca. 5. Matlazinca. 6. Mixe. 7. Kiche. 8. Cachiquel. 9. Tarahumara. 10. Tepehuanan, &c. Of these I have procured already ample vocabularies of the two first.

3d Series. Hardly known, of which we possess as yet but few words. 1. Zapotecas. 2. Zacatecas. 3. Chol. 4. Chontal. 5. Pininda. 6. Opata. 7. Endeve. 8. Quelene, &c.

4th Series. Quite unknown for lack of materials, although they are yet spoken languages, and some are but dialects of those above. 1. Utlateca. 2. Cohuichi. 3. Tlahuichi. 4. Zoque. 5. Mame. 6. Chiapaneca. 7. Chochona. 8. Mazateca. 9. Cuiscateca. 10. Popaloava. 11. Tubar. 12. Yumas. 13. Seres. 14. Moba, &c. Besides many dialects of California, Texas and New Mexico.

Although they may be mere dialects it is needful and desirable to have materials on each, so as to reduce this to a certainty and to trace their mutual analogies or deviations, as well as the probable time of the separation of the tribes.

These 40 Mexican dialects will thus be reduced very probably to 5 or 6 primitive languages, as those of the United States have already been reduced to seven, the Onguy, Lenih, Chactah, Otaly, Capaha, Skere, and Nachez, by myself in the manuscript history of the American nations. And in the whole of North and South America hardly 25 original languages and nations are met with, although actually divided in 1500 tribes and dialects; as the actual European languages, only 6 in number originally, are now divided into 600 dialects, some of which are even deemed peculiar languages at present.

Thus these original or mother languages of Europe are the Pelagian, Celtic, Cantabrian, Teutonic or Gothic, Thracian or Slavonian, and Finnish. And out of the Gothic have sprung the English, Dutch, German, Danish, Swedish, &c. which were once mere dialects, but are now become languages having many dialects of their own.

6. History and Zoology.

The Domestic Animals of Mankind and the American Nations.

By C. S. Rafinesque.

I mean by domestic animals those which have been tamed by mankind, and dwell in freedom with men, becoming subservient to their use; by no means those which are pursued or kept in chains and cages.

The number of these domestic animals has always been deemed a standard of civilization, and the cultivation of plants is another.

The slanderers of the American nations (Robertson included) have not been willing to perceive any high civilization in this continent, and have totally overlooked the numerous animals they had domesticated.

In America the number of domestic animals was greater than in Asia, Europe and Africa! this assertion is not a paradox; but a positive fact, which I shall presently prove completely. I do not mean to include among the domestic animals of this Continent, those introduced since 1002 by the Scandinavians, nor since 1492 by the Spaniards; but merely those domesticated by the primitive and ancient nations of America.

I shall form two collateral tables of the domestic animals of the two Continents, and afterwards quote my authorities for those of America; since in the actual state of our knowledge, so much that relates to America is endeavoured to be forgotten, that it becomes needful to recall continually the ancient authors which our popular writers are too lazy to read, consult and adopt.

Abbreviations in the Table.

N. A. North America. A. Asia.
S. A. South America. E. Europe.
W. I. West Indies. Af. Africa.
M. Mexican States. P. Polynesia.

This being intended as a popular Essay, I shall give the common names of animals merely.

1st TABLE.

Domestic Animals of America.

I. QUADRUPEDS.

1. Lama
2. Paco
3. Taragua
4. Huanuco

(4 Species of the G. Vicunia, S. A.)

5. American Bison, N. A.
6. American Elk, N. A.
7. Virginian Deer, N. A.
8. American Bear, N. A.
9. Pecari Hog, S. A.
10. Tayasu Hog, S. A.
11. Dog—7 varieties, N. A. S. A. & W. I.
12. Aguti
13. Cavia
14. Paca
15. Huti

(4 Species of Rabbits but of different genus. S. A. & W. I.)

16. Tapir, S. A.
17. Capibara, S. A.
18. Coati, M.
19. Raccoon, N. A.
20. American Badger, N. A.
21 to 31. 10 Species of Monkeys in S. A.
32. Flying Squirrel, N. A.
33. Manati or Sea Cow, W. I. and S. A.

2d CLASS.—BIRDS.

1. American Hen, N. and S. A.
2. Musky Duck, S. A.
3. Manedis
4. Powis or Agami
5. Hoco
6. Wacarara

(Domestic Fowls of Guyana.)

7. Turkey, M.
8. Cocolin Quail, M.

2d TABLE.

Domestic Animals of Asia, Europe, Africa and Polynesia.

I. QUADRUPEDS.

1. Common Camel, A. E. and Af.
2. Bactrian Camel, A.
3. Common Ox, A. E. Af.
4. Buffaloe, A. E. Af.
5. Asiatic Elephant, A.
6. Horse, A. E. Af.
7. Ass, A. E. Af.
9. Hog, every where.
10. Dog, (15 varieties) do.
11. Cat, do.
12. Ichneumon, Af.
13. Rabbit, E.
14. Ferret, E.
15. Sheep, A. E. Af.
16. Goat, A. E. Af.
17. Antelope, A. Af.
18. Yak or Thibet Cow, A.
19. Reindeer, E. A.
20. Ounce, A.
21. Marmot, E.
22. Otter, A. E.
23 to 25. 3 sp. Monkeys in Asia and Af.

2d CLASS.—BIRDS.

1. Hen, every where.
2. Pidgeon, do.
3. Goose, do.
4. Duck, do.
5. Swan, do. rare.
6. Guinea fowl, Af. E.
7. Peacock, A. E.
8. Pheasant, A. E.

9. American Crane, N. A.	9. Partridge, E.
10. American Pidgeons, N. A.	10. Quail, E.
11. Canada Goose, N. A.	11. China Diver, A.
12 to 25. Parrots 14 sp. S. A. and W. I.	12 to 19. Parrots, 8 sp. A. 6.
26 to 28. Ducks 3 sp. in Brazil and Peru and M.	20. Dove, A. E.
29. American Ostrich, S. A.	21 to 25. Falcons and Hawks, 5 sp. A. E.
30. Flamingo, in Cuba.	
31. Ringdoves, N. A.	
22. Carib Goose, W. I.	
3d CLASS.—REPTILES.	**3d CLASS.—REPTILES.**
1 to 5. Land and Water Turtles, 5 species, S. A.	1 to 3. Land Turtles, 3 sp.
5 to 8. Iguanas, 3 species.	4 to 10. Snakes, 7 sp.
9. Rattle Snake, N. A.	
10 to 15. Harmless Snakes, 6 sp. M. and S. A.	
4th CLASS.—FISHES.	**4th CLASS.—FISHES.**
1. Remora, W. I.	1 to 10. Sp. of Carps, and Pond fishes, Gold fish, &c. China, A. E.
2 to 12. Pond Fishes of M. Guatimala, Peru, &c.	
5th CLASS.—INSECTS.	**5th CLASS.—INSECTS.**
1 to 3. Bees, 3 sp. S. A.	1. Honey Bee, A. E. Af.
4. Red Cochinille, M.	2. Silk Worm, A. E.
5. Monteres or Yellow Cochinelle, M.	3. Kermes, E.
6. Silk Worm of Mizteca, M.	4. Fig Cynips, E.
7. Cucuyo or Acudia, W. I.	
8. Termes, S. A.	
6th CLASS.—SHELLS and WORMS.	**6th CLASS.—SHELLS and WORMS.**
1 to 5. Oysters, 5 kinds, N. and S. A.	1. Oysters, E.
6 to 10. Clams and Shells, 5 sp. N. and S. A.	2. Muscles, E.
11 & 12. Palm Worms, 2 sp. S.A.& W.I.	3 to 5. Other Shell Fish, E.
	6. Pinna or Bissus, E.
RECAPITULATION.	**RECAPITULATION.**
33 species of Quadrupeds.	25 species of Quadrupeds.
32 " Birds.	25 " Birds.
15 " Reptiles.	10 " Reptiles.
12 " Fishes.	10 " Fishes.
8 " Insects.	4 " Insects.
12 " Shells and Worms.	6 " Shells.
112 Species in America.	80 Species in the other Continent.

Such a great number of domestic animals were not collected every where; but a small number found in different localities in America and elsewhere.

The domestication of animals began before the flood, since the *Abelites* or Pastoral tribes, and the *Cabulites*, *Cabils*, or *Cainites*, agricultural tribes had at least reclaimed the sheep and the ox soon after Adam. Yet in the earliest Chinese history only 6 domestic animals are stated to have been reclaimed by the *Fuhites* 300 years after the flood of Yn-ti or Noah, which were the horse, the ox, the sheep, the dog, the hog and the hen.

The other animals were gradually tamed elsewhere. Some are of local and limited range, such as Yak confined to Thibet, Ferret to Europe, Reindeer to the Boreal Regions. Europe has only received the Buffaloe and Camel lately from Asia; and since 1492 some of the American domestic animals have been introduced there. Such as the Cavia,

Turkey, Musky Duck, and several Parrots.

In America the 4 kinds of Vicunia or Peruvian sheep were spread by the Peruvians to Chili, Tucuman, Paraguay, &c. and the Dog was found every where; while the domestic Tapir, Tayasu and Peccari were confined to some small tracts in South America. The common Virginian deer is found wild all over North America; but we hear of its domestication only in Florida.

Let us detail the proofs of the American table drawn from the earliest travellers and writers on this continent. The domestic animals of the Mexicans were several kinds of dogs, deer, fowl, ducks, cocolin, turkey, snakes, fishes, cochinille, &c. See Cortez, Herrera, Clavigero, and all the writers on Mexico.

The Taensas, Cenis and other nations of Texas and Louisiana, had tame turkeys, ducks, hens, pidgeons and ringdoves, 150 years ago, when independent, see Lasalle, Tonty and Hennepin.

In 1678 the Chicasas had tame Indian hens and turkeys, see Tonty's travels.

In Xalisco to the N. W. of Mexico, several snakes were tamed and kept in the houses, to destroy insects. In other parts of Mexico the beautiful coral snake was kept as a pet by the women. See Herrera and Purchas.

Ayllon who explored Chicora or Chicola the eastern part of Florida now Georgia in 1514, &c. found there tame ducks and geese, and besides deer kept like cattle in folds during the night, ranging out in the day, returning home in the evening; the does were milked like goats, and the Indians drank the milk. See Ayllon's relation in Peter Martyr d' Angleria.

The first Spanish explorers of New Mexico or Cibola found the bison or American buffaloe kept in folds and pens, like cows. See Herrera, Hackluyt, &c.

Lawson in his travels in Carolina towards 1700, says that the Congaris and Wateris had tamed the American crane.

The Miztecas of Mexico raise a kind of silkworm to this very day, see Poinset: it is a native kind.

In the West Indies, the beautiful bird flamingo or the *Phenicopterus ruber* had been tamed in 1494, in Cuba; also several large parrots, and even a fish the Remora or *Echeneis* which was used by the fishermen to catch turtles and fishes by grasping them. They had also tame partridges and iguanas in 1508. See Columbus, Diaz, Ocampo, Acosta, &c.

In Hayti they had tame iguanas, manatis or sea cow, and several kinds of rabbits or agutis. They also used the cucuyo or fire-fly as a convenient light. See Columbus, Martyr, Acosta, Munoz, &c.

Several tribes of North America have tamed the bear, the raccoon, the badger, and keep them in their houses to this day. The flying squirrel is a common pet with the boys and girls.

In Guatimala and South America many species of monkeys were tamed and kept in houses; but we are seldom told which species they were. The Aruwacs of Guyana delight to keep the beautiful little monkey called sucawin, not larger than a rat. See Bancroft, Bolingbroke, Stedman, Strangeways, Acosta, Herrera, &c.

In Darien and Yucatan there were herds of tame pecaris kept like hogs according to Herrera, before 1540.

The Epurimei of Guyana kept tame pecaris, tayasus, and deer. See Purchas. This deer must be different from the Virginian deer and must be added to the table.

The 4 kinds of tame fowl of Guyana are mentioned by Waterton; but they are spread under other names as far as Guatimala and Brazil.

In 1519 Pigafetta found the Aruayas of Brazil with tame geese, fowl, parrots, monkeys, and also

the tapir or anta had been tamed by them. He found also the patagons with tame huanacos.

The Diaguitas of Tucuman had tamed the ostrich, also geese and hens before 1550. See Techo.

Four species of rabbits, *Paca nigra* and *Paca fulva*, *Cavia aguti* and *Cavia acuchi* were domesticated from the West Indies to Peru and Paraguay, under various names, *Capis* and *Cuyus* in Peru, *Papos* on the Maranon and among the Guaranis as early as 1534. *Quinaxes* in Quito, *Aperea* in Brazil, *Hutia* in Hayti, &c.

Dogs wore found from Canada to Chili; some peculiar varieties existed: the alco of Mexico had no hair and was very good for food: the aperuca of Peru was a black dog.

The Muras or Aymores of Brazil and E. Peru had many kinds of tame fowls and ducks. Acuna mentions that 200 years ago the tribes of Maranon had tame turtles, manati, anta or tapir, pecari and paco.

Of the five species of Vicunia, the Peruvians had tamed 4, the true mountain Vicunia alone remaining wild and untamable. They were used as beasts of burthen, for wool and food. Sometimes even as horses to ride upon by the Achkeres of West Brazil in 1540 and the mapais, or mbayas of tucuman in 1548; they called the lama by the name of Amidas. The tribes of Chaco had in 1548 tame deer, lama, geese, and they cultivated a kind of wheat and of rice. See Gili, Lozano, Lavega, Schnidel, Purchas, &c.

The Panches of Cundinamarca kept the large ants or termes in yards to breed, using them to make a kind of bread. See Piedrahita and Touron.

The Carios of River Parana had tame lamas, pecaris and geese in 1539; see Schnidel's Travels.

The Chilians, Araucas and Huenus or patagons had tame guanacos and goats: they cultivated 2 kinds of wheat.

The partridges of Maranon have been omitted in the table. They must be different from those of Cuba. The Caribs had tame geese and parrots in 1493 at Guadalupe when discovered by Columbus.

In Chiapa a yellow cochinille is raised called monteres; see Juarro. The true cochinille of Oaxaca and E. Mexico is well known. The same or a different kind is also found in Guatimala and Guayaquil.

In Collot's travels I find that the Alitans or Snake Indians of New Mexico, keep tame rattle-snakes, which they venerate, and feeding them on flour only, they lose their poisonous property! this is strange if true.

The capibara is tamed in Brazil, the coati in Guatimala, the American elk is easily kept in parks and folds. The beaver alone, so useful and so sociable, has never been tamed, but wantonly destroyed.

Some Indian tribes took care to spread and keep the oysters, pearl oysters, muscles, clams, &c. The palm worms esteemed a delicacy in Guyana were taken care of, as well as 3 kinds of bees. See travels in South America.

The result of this Enquiry will be that more animals have been tamed than we were aware of, particularly in America, and that the Americans had little cause to regret lacking the horse, camel, ox, sheep, goat and hog, since they had for equivalent the vicunias, deer, bison, pecarris, tapir, &c.

I have long been convinced that the civilization of many American nations, such as the Toltecas, Mexicans, Tarascas, Apalachians, Mayans, Quiches of North America, and the Muhizcas, Peruvians, Araucanians of South America, was not so low as represented by their tyrants and detractors; but equal if not superior to that of the Spanish invaders of 1492: which fact will be easy to demonstrate; but this is neither the time nor place. I have merely illustrated one of the many proofs of

their civilization, by introducing a subject which had been overlooked by all, even Humboldt, and Macculloh.

Two species of deer, the Mexican and Guyana deer must be added to the table, also the Puda goat of Molina tamed in Chili: and 5 species of birds, the partridges of Cuba and South America, besides the American swan and pelican, both of which I have seen domesticated. Thus the American domestic animals will be increased to 120 species. I have also seen buffaloes, elks and deer in parks in Kentucky, in freedom, yet coming at the call to be fed with corn or salt, and never endeavouring to escape from a park merely surrounded by a common fence. Such was the park of Col. Geo. Thompson at Shawanee Spring near Harrodsburg.

7. ZOOLOGY.

On the Moles of North America and two new species from Kentucky.

By C. S. Rafinesque.

The moles like many of the small quadrupeds of this continent, are hardly known and distinguished as yet. Several of them have been mixt in the genera *talpa*, *sorex*, *scalops*, *spalax*, *condylura*, *&c.* of the naturalists. In Harlan Fauna Americana the G. *spalax* is omitted, as well as the *tuzan* of Mexico and Louisiana, and the N. G. lately discovered in Maine. He has only one mole or *talpa* of North America and he deems it the T. *europea* saying in the character *fur black*, and in the description *fur cinereous*, *fan on the throat*, *&c.* and then he has 4 varieties *spotted*, *white*, *yellow* and *cinereous* again.

All the animals burrowing and raising the earth in ridges are called moles in the vulgar language: although they may not all be *talpa*; the shrews are the G. *sorex*.

In 1814 I distinguished one of the moles found in the Atlantic States by the name of *talpa cupreata* (precis. sp. 7.) which I had observed in 1802, it differs from the European kind, which *I have seen in Europe*, by tail one seventh of whole length, colour of a shining brown with coppery purplish shades, throat slightly fulvous. The European mole may be found somewhere in North America, but I have never seen it.

In 1820 I described in my Annals of Nature, sp. 5. the *spalax vittata*, with striped back, &c. The compilers who seldom travel and neglect the published labours of travellers who have wandered in search of knowledge; have not noticed these two species. This last however has been also seen by my friend Audubon, who first made it known to me, and is inserted in the English Journal of Zoology of 1822. The G. *spalax* of Erxleben contains the mole rats without tails.

Mr. Harris of Machias in Maine, has discovered and described a very singular mole of that State, which he deems a N. G. and calls *astromycter prarinatus*. Not being yet introduced in the books of compilers, I'll give a short account of it. G. *astromycter*. Snout stellated, no external ears, eyes small, legs short 5 toes to each, anterior scaly with long strait claws, posterior longer with shorter curved claws, tail scaly, fusiform, with thin hairs.

Sp. *A. prasinatus*. Hair glossy green, snout naked long with cartilagineous stellated processes, and two others longer before: tail pedunculate, fusiform, cylindrical, acute, two fifths of whole length; body 4½ inches, tail 3.

In 1820 I discovered two new moles in Kentucky, one is rather common and the substitute of the common mole in the gardens. I call it *talpa macrhina*. The other *talpa sericea* is rather scarce. A specimen was in Clifford's museum.

1. *Talpa machrina*, Raf. 1820.—Long-nose mole. Fur thick, brown with greyish shades; nose elongate, depressed, naked and tuberculate; tail one sixth of whole length white, squared, naked, feet white.

Total length 7 inches, tail 1¼ but only ¾ out of the fur. Body thick, covered with a soft silky fur ¼ inch long, shorter and woolly on the head; nose almost like a proboscis ⅛ inch longer than the lower jaw, moveable, base white villose, and naked rubicund; feet naked, the anterior broad, rounded flat with 5 toes thick and subpalmate or coherent, 5 claws nearly equal, large, convex above, flat beneath; posterior feet more slender, claws smaller, longer and narrow. In woods, gardens and fields, near Lexington, &c. Raises flexuose burrows of great length.

2. *Talpa sericea.* Raf. 1820. Silky mole.—Fur short silky, grey, with silvery shades; nose short obtuse; tail one fifth of whole length cylindrical.

Smaller than the first and more slender, only 5 inches long, body 4 and tail 1. Fur very peculiar and different from the other moles, not being reducible to different directions; but imbricate as in other quadrupeds; remainder as in the first sp. Found in woods near Nicholasville and Harrodsburg.

8. *Description of a New Otter*, LUTRA CONCOLOR *from Assam in Asia.*

Dr. M. Burrough of Philadelphia, has been a great traveller and collector in Zoology, having made a voyage round the world, travelled in Peru, Panama, West Mexico, Sandwich Islands, and Bengal. His greatest Asiatic excursion was a journey from Calcutta to Assam in the Imalaya mts, by the Baranputra river; it is to be wished that he may publish his Journal of it. He has brought to Philadelphia some fine or new animals and many shells.

Among his quadrupeds, he has an otter from Assam, which I pronounced new, and he has permitted me to describe. I call it *lutra concolor*, being of a uniform color; it might also be called *L. amblonyx* from its blunt claws.

S. G. *Amblonyx*, Raf. Claws short obtuse, not sharp nor crooked; while they are so in the other otters.

Lutra concolar. sp. ch. Entirely of a uniform bay color, tail depressed as long as the body, claws blunt.

Description.—Total length 2½ ft. head and neck ½, body and tail each one foot; nose blackish, no whiskers, ears very small; six small close incisores to each jaw, canine teeth large, grinders sharp; feet short, with 5 unequal palmate toes, and claws as above stated; tail slender flat acute.

Found in Assam and the Garrow hills. Dwells mostly on land, seldom goes to the water; feeds on fish and fowl. C. S. RAFINESQUE.

Philadelphia, 27 March, 1832.

P. S. Dr. Burrough has again sailed on another voyage to Buenos Ayres and China, from whence he will no doubt bring many rare objects of Zoology.—May 1832.

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9. COUGUARS of OREGON. By C. S. R.

In addition to the article on our Couguars, p. 19, I have to state that several other varieties of tygers are found in the Western wilds of the Oregon Mts, or East and West of them, which deserve to be noticed.

I find in my notes that two other varieties of Couguar have been seen there, and East of the Mts.

1. Var. *Oregonensis.* Dark brown, nearly black on the back, belly white; body 6 ft. long, 3 high, tail 2 or 3 ft. long. A large ferocious animal of the mountains. Is it not a peculiar species? *Felix oregonensis.*

2. Var. Very near the Pennsylvania or rather Alleghany Couguar. Body nearly entirely tawny or bay, rather shorter, smaller and lower than the last, more slender, less ferocious. Dwelling in the plains east of the mountains near woods, but pursues the game in the plains or prairies, preying on deer, elks and buffaloes.

I find in Leraye's travels that a smaller animal, nearly similar in color, but not larger than a cat is

found east of the Oregon mountains, which is very fierce, and often kills large animals, wild sheep and goats by jumping on their necks and cutting the flesh and arteries, until they fall. Is it a new species?

Felis macrura, Raf. Entirely of a sallow color, tail as long as the body, which is from 1 to 2 feet long only.

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10. Ornithology.—Description of a new Eagle from South America, *Aquila dicronyx* or Macarran Eagle. By C. S. R.

Mr. Macarran of Philadelphia has had for 5 years in his small menagerie and botanic garden, a beautiful eagle, kept alive in a cage in the open air during the coldest winters, being a native of the cold climate of Antartic America. He was found by the mate of a vessel near Buenos Ayres, while yet young, feeding on a dead horse, and taken alive without much difficulty. He has grown and improved in colors since bought by Mr. Macarran. Although fierce and wanting to fly against the boys when they annoy him, he is very tame and grateful towards his keeper: he knows him as well as friendly visiters, and greets them by peculiar postures, looks or cries. He has several kinds of cries rather harsh, to express joy or anger. He feeds on every kind of flesh, offals or even fish and dead animals. He will kill rats and eat them. He is a beautiful noble bird, when he expands the wings they fill his large cage. His gait is clumsy and he oftener jumps than walks.

I have called him *Aquila dicronyx* from the singularity of claws of two colors.

Aq. dicronyx. spec. ch. Bill horny, feet yellow, claws black, but the middle claw horny or whitish; plumage blackish, head greyish, tail whitish, end of it rusty.

Description.—Total length 3 feet, wings expanded, 9 feet; bill large strong 4 inches long, shaped as in the eagles, of a horny or whitish-yellowish color; cere and lore brownish; eyes black and bright, iris yellow; head greyish above and across the eyes, nearly white beneath and above the eyes; feathers nearly black with a lead colored cast, white at their base; wings slate colored beneath; Uropygial feathers mixt of black and grey. Tail with a rusty band at the end. Feet yellow very strong, feathers not quite to the toes. Claws strong and black, that of the middle toe same color as the bill.

When younger this bird was entirely of a bluish black, or dark lead color, the head and tail have since changed, but the rusty band of the tail and claws were permanent and are proeminent distinctions between this eagle and the whitehead eagle.

Mr. Audubon admired this eagle and wanted to purchase him; but Mr. Macarran would not take less than $ 100 for him.

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11. Erpetology.—On the Salamander of the hills of East Kentucky. *S. lurida.* by C. S. R.

I discovered in 1823 a new land salamander in my excursion to the falls of the river Cumberland, dwelling in the hills near that river in East Kentucky, among logs and rubbish in woods.

It is a sluggish and ugly animal, but rare and not easily detected among dried leaves, being of a dull color, only 3 or 4 inches long.

Salamandra lurida. Entirely grey with two rows of black spots on the back, tail as long as the body with blackish rings, belly whitish. The tail is rounded as in the land salamanders, and the toes are 4 and 5 as in the whole genus.

I take this opportunity to state that my sal. or sp. *lucifuga* of last No. is different from the *Salamandra longicauda* of Green, having compared them, I find by specimens of this last, that the dots are larger, fewer, rounded, and lacking beneath; head smaller not so flat, mouth smaller with minute acute

teeth in both jaws; but the eyes are nearly alike and both have the nictitant membrane very properly compared to that of the owls by Green.

12. Description of two new genera of Soft Shell Turtles of North America.—By C. S. Rafinesque.

APALONE and MESODECA.

The following account was prepared for the Philosopical Society of N. York in October 1816; but not published at the time. It is now given as written 16 years ago.

The Zoologists had preserved the Genus *Testudo* of Linneus, till Dumeril in 1806 established the G. *Chelonias* for the Sea turtles with feet like fins, the G. *Chelys* for the T. *matamata*, and the G. *Emys* for all the turtles with 5 moveable palmated toes. Lately the G. *Trionyx* has been proposed by Geoffory for the soft shell turtles with 3 toes and claws. But last year I proposed in my analysis of Nature (Palermo 1815) to divide the Turtles into 15. G. as they offer so many other important Characters.

They were 1 *Chelonias* D. 2 *Testudo* D.

3. *Gopherus*, Raf. With flat round nails. Type. T. *polyphemus* of North America.

4. *Chelonura*, Raf. with long tails 5 & 4 claws. the bills serrated. Type T. *indica*, many Sp. here blended.

5. *Chelyra*, Raf. Soft shell Sea turtles with sulcated back. Type T. *coriacca*.

6. *Trionyx* of G.

7. *Cheliphus*, Raf. Water turtles with Valved shells 5 claws and toes to all the feet.

8. *Uronyx*, Raf. an anterior valve to the shell, toes and claws 5 and 4, tail with a claw. T. Scorpioides, &c.

9. *Didicla*. Raf. Bivalve lower shell, toes 5 and 4. Type T. *clausa*, *odorata*, &c.

10. *Monoclida*, Raf. Lower shell valvular anteriorly, toes 5 & 4. T. *retziana* &c.

11. *Emyda*, Raf. or *Emys* D.

12. *Chelyda*, Raf. or Chelys D.

13. *Chemelys*, Raf. Warty Scales, no valves 4 toes to all the feet. T. verrucosa &c.

14. *Chelopus* Raf. No valve, toes not palmated 4 and 5. T. *Punctata* &c.

15. *Cheliurus*, Raf. No valves, feet palmated a long scaly tail. T. Serpentina &c.

This year I have discovered in my journey to the falls of the Hudson and to Lake Champlain, a new Soft Shell turtle which has 5 toes instead of three as *Trionyx*, and which I propose to call *Apalone*. Bartram has long ago described and figured another Soft shell turtle with 5 claws, which has been commonly blended with the T. *ferox*, this must form also another Genus *Mesodeca* by having 10 Scales in the middle of the back.

1 N. G. *Apalone* Raf.

The name is contracted from *Apalochelone* meaning Soft turtle.

Char. G. Body and limbs soft without scales. Nose proboscidal, jaws without a bill. Upper Shell smooth soft with a small keel anteriorly. Lower Shell anterior, body denudated behind. Five palmated toes to all the feet, with small claws. Tail short corrugated.

Apalone Hudsonica, Raf. Upper shell rounded elliptical, flat, entire, yellowish with brown spots, and a circular black line near the margin. Two oblong occulated spots before and behind the eyes. tail obtuse mucronate shorter than the shell.

A very pretty small species from 2 to 6 inches long, found in the River Hudson between the falls of Hadley, Glen and Baker, and further up to the source. It is called mud turtle and not eaten. It is a lively pretty animal, quite harmless, as it cannot bite, having no horny hard jaws. It dwells in the mud and sand, and buries itself under it in winter. It feeds on small shells and fishes.

Body olivaceous striped and dotted with brown; but entirely smooth without warts. Neck retractible and elongated when extended, grayish clouded with rufous as well as the feet. Head small with 2 singular large spots one before and one behind each eye, oblong yellow with a black margin, appearing like as many eyes; while the true eyes between them are small round with a yellow iris. Nose tubular like a proboscis extending beyond the mouth, and truncated with 2 round nostrils. Mouth large, with thin soft lips. The hind part of the body is denudated beneath, the lower shell extending only half way from before and is blueish white. Vent round, tail conical short thick rugose obtuse mucronate. Feet spotted, toes black, 5 unequal with small claws. The upper shell is very entire and prettily spotted, the margin is yellowish unspotted, then comes a circular black line blackish but spotted of brown, while the centre is olivaceous yellow with many round spots occulated and clouded by having a brown margin, with grey dots within. The small half keel extends only to the middle or as far as the lower shell below.

II. N. G. Mesodeca Raf.

The name means *middle* with *ten* Scales.

G. Ch. Body and limbs soft upper shell soft but with 10 hard scales in the middle, and 10 pair of hard lateral ribs,

with many horny warts before and behind. Lower shell hard and horny in the middle. Head with lateral compartments above and lateral contractible warts. Nose proboscidal. Mouth with horny jaws. Five palmated toes to all the feet with crooked claws.

Mesodeca bartrami, Raf. Upper shell elliptical entire brown unspotted. Head long, neck rugose, warty.

Synonyms. Great Soft shell Tortoise Bartram's travels in Florida (Philadelphia 1791) page 177 to 179 fig. 4 and 5.

Testudo ferox of many authors but several species have been blended by them, found in Carolina, Alabama, and Louisiana, while Bartram says he found this only in East Florida. The T. *ferox* had been described and figured by many authors; but their figures and descriptions must be compared and revised. When not copied from Bartram they apply to other species or the true T. *ferox* of L. first figured in Philol. Trans. vol. 6. fig. 10. See also Lacepede, vol. 1. tab. 5. and Schoepf. turtles, tab. 19.

This turtle of Bartram cannot more be the T. *ferox* which is a true *Trionyx*, than the *Apalone*! For the complete description and history of this species see Bartram's page and fig. quoted. It is one of the most explicit descriptions of his book, and the 2 figures of the body and head are no doubt correct. It is a large sp. 2½ feet long and weighing from 30 to 40 lb. excellent to eat. Although carnivorous it is no more ferocious than all the other turtles and terrapins feeding on prey.

New-York, October, 1816.

13. Geology and Oryctology.

Extracts of a Series of Geological Letters to Prof. Al. Brongniart, *President of the Geological Society of Paris; by Prof.* C. S. Rafinesque.

First Letter, March 1832.

There are now 4 schools or Systems of Geology in the U. States.

1. The old school to which Maclure, Mitchell, James, Troost, Nuttal, Schoolcraft, &c. belong. This is properly an American branch of the Wernerian school. They neglect fossil remains and merely depend upon the position of rocks.

2. The Northern school of which Prof. Eaton and Silliman are the founders: it has many followers in the Northern States. It is based upon the series of formations from Boston to Lake Erie. It neglects fossils also, and lacks the solid foundation of Oryctology. It surmises that all the rocks of the U. States must agree with those of the North, without being able to prove it, since Eaton who has laid out the series of rocks, has never seen those of the South and West. He leans to the Plutonic theory.

3d. The English school believes that the whole world is to be found in England, and that our strata and formations must agree of course with those of England. Prof. Featherstonaugh, who has given lectures on this System of Geology, and now publishes a Journal of Geology is very sanguine and active on that opinion. He has many followers, who all incline to the Huttonian theory. They know that Oryctology is as needful to Geology, as Chronology is to History; but have hardly began yet to examine our fossils in sites.

4th. The fourth school is my own, I call it the *Natural and Oryctological Method of American Geology.* I began to teach it in my public lectures in Lexington in 1819 and 1820. Mr. Clifford and others had adopted it. I have not published much upon it yet; I was apprehensive of hurting the ideas of the systematic writers. But after 30 years of observations and reflections I think that I can boldly venture to compete with them for what I have seen and studied, while they have not. My theory is not a system; but the result of what I have seen in the South of Europe, Sicily, the Azores and this Continent: nor do I mean to apply it to the whole world, as I deem that every region has peculiar local features. I take besides whatever is good in every previous theory.

I propose to divide the formations as follow, in 3 series and 10 groups; each with many formations.

1. Series.—Inorganic formations.
   1 gr. Uniform formations.
   2 gr. Compound formations.
   3 gr. Volcanic formations, including the Basaltic and Trapic.

II. Series.—Organic formations.
4 gr. Primary or Vetustal.
5 gr. Secondary or Planial.
6 gr. Tertiary or Alluvial.

My primary organic formation answers to the transition of Werner, the secondary to his floetz rocks, and the tertiary to the deposited alluvions, diluvions, &c. which I divide into diluvial, fluvial, pluvial and litoral.

III. Series.—Anomalous formations.
7 gr. Vegetable formations.
8 gr. Animal formations.
9 gr. Human formations.
10 gr. Atmospheric formations.

I am prepared to support and demonstrate this natural theory, by physical, oryctological and ocular proofs. I have taken, as it were, nature *sur le fait* in Sicily and America. I have seen the various anomalous formations forming. I have discovered the craters or mouths of the eruptive salses or pseudo volcanoes, calcareous, slaty and carbonic, to which are due all the organic formations. When not visible, they are covered or obliterated like those of basalt and many volcanic strata.

This leads me to explain my views on this series. I deem all these organic strata of the second series, formed by emanations or salsic eruptions of oceanic SALSES or submarine pseudo-volcanoes, except the modern alluvions; but many ancient alluvions may also be owing to watery salses or eruptions of water. Baron Humboldt has surmised that the Asiatic flood was caused by an eruption of the Caspian sea. Our American lakes may have caused floods with us, and Volney deemed Lake Ontario such an aquatic volcano.

These volcanos were not ignivomous like those of the first period or series, but salsivomous; they were under the sea in the primary and secondary formations; but on dry land in the tertiary. They ejected by turns and alternate paroxysms the mud or slimes which have formed the organic strata; either calcareous, slaty, argilaceous, carbonic, gritty, sandy, &c. which are found to alternate, and spreading horizontally they overwhelmed and imbedded the marine fossils which we find in them.

I do not know if this theory has any followers in Europe; I presume not, since Patrin who had partly foreseen it, has not been believed. It is with the utmost astonishment that many hear of it here, yet it explains every thing without the least difficulty, while all the geologists are puzzled with the intermixture of strata and fossils. And above all the carbonic formations, so vainly attempted to be reduced to a plausible theory.

We have in North America 3 kinds of coal, or carbonic formations: 1. Anthracite. 2. Bitumite. 3. Lignite. This last only is of vegetable origin, and belongs to the alluvial or tertiary group, being mixed with the alluvial clay of our great streams. The anthracite is chiefly found on the Eastern slope and borders of the Alleghany mts. among the shales and grits, while the bitumites or bituminous coal is much more common on the summit and eastern slopes of the Alleghany mountains, among the slates and limes. They are both evidently of eruptive origin like the strata which are above and below them. There is no need to suppose a multitude of physical revolutions, successive floods and cataclysms to form them out of vegetable ruins. All is easily explained by alternate emanations or eruptions, with the other organic formations. Has it ever been calculated what would have been required to form our carbonic strata out of lignose fragments; forests covering the whole earth, (which was not then quite dry land,) with trees as thick as the grass of a meadow, would hardly be sufficient for a single stratum. And we have many such over each other, separated by thick strata of schist, grit and lime. The vegetable fossils found in them, most of which are marine, have been imbedded there, as they have in the

grit (and like animal fossils in limy and sandy shale) by carbonic eruptions of litoral and marine salses.

Note.—I am glad to add that Mr. Hembel and perhaps many others reject the absurd vegetable theory of coal.

I send you figures and descriptions of 7 of our fossil plants for the Geological Society.

1. *Rytoma equalis*, Raf. disc. 1821 in Kentucky in the Wasioto hills, and the carbonic region. It is an impression on clay-stone, reddish brown. It is near to *Calamites*, but flat, not cylindrical, although neither distorted nor flattened. *Gen. car.* Straight, flat, long, cut at equal distances by transversal furrows, others smaller longitudinal approximated, separated by flat ribs. *Spec. car.* Furrows deep and narrow, the transversal larger, the ribs larger than the longitudinal furrows. (3 inches.)

2. An unknown *Lignite (L. Clifordi)* from the carbonic regions of Kentucky, disc. 1822. Superincumbent to coal in the grit. Resembling the *Phytolites dawsoni* of Steinhauer. Petrified in sandstone grit. Brown outside, grey inside, impressions on both sides, fibres flat parallel unequal in length, equal in breadth, strias between very small, interior obliterated, yet a little porose.

3. *Mesiphites clavata*, Raf. A singular fossil of the diluvium of Philadelphia in iron clay. Is it a plant near to the fistular Fucus, or an animal near to *Holothuria?* Mr. Peter A. Browne has figured several of these fossils, perhaps different sp. in the Journal of Geology. I shall publish them again with his figures and my names. Are the singular fossils lately discovered in the ferruginous diluvium of Nova Scotia, similar to these?

4. *Cladocerus alcides*, Raf. 1818. Fossil resembling the horn of an elk, but rather a plant, disc. 1818 in the calcareous shale of Kentucky. It is very near to my N. G. *Somarites* (enum. sp. 73) which I placed among the Alcyonites; but which is perhaps a plant also (or a porostome) differing from this merely by having no outward tegument. Gen. Car. Irregular, compressed, palmate, subranose, twisted; interior a little fibrose. Exterior with a tegument covered by flexuose longitudinal furrows. *sp. car.* Difforme, oboval, obliqual, palmate, truncate or split, one side angular, the other thick, furrows unequal curved or flexuose often twisted. 2 or 3 inches.

5. *Trispinites obliqua*, Raf. 1818. Very singular fossil, resembling an *Eschara*, but apparently a plant, without any cell or mouth. From Clifford's museum, discovered by him in the sandy grit covering the coal on New River in West Virginia. *Gen. Car.* Surface flat tesselated, each square with an oblique heart shaped impression, and 3 prominent spines behind. *Sp. Car.* Angular or squared, 3 or 4 tesselated squares on one inch. Size 4 to 6 inches.

6. *Porimites levigata*, Raf. 1818. Nearly smooth, pores round.

7. *Porimites sulcata*, Raf. Deeply sulcated, pores oblong or elliptical.

These two splendid fossils, were discovered by Mr. Clifford in the sandy grit of the Cumberland and Clinch mountains in Tennessee. The fragments were a foot long, and 6 inches in diameter, cylindrical, very hard, nearly silicified and brown. Is it a fossil plant near the *Cactus* or animals near the Millepores? *Generic Car.* Body cylindrical, solid, no tegument, covered outside with longitudinal wrinkles, and regular rows of pores, alternating; each with a mamillar centre.

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14. *Remarks on the Silicious Fossils of North America.*

[Translated from the French.]

By C. S. Rafinesque.

The Essay of Brongniart on the silicious orbicules has begun to unfold some important geological facts. As I can add some others to those indicated by him, I will venture some remarks on the silicious fossils of the great central basin of N.

America. This immense basin extends from Canada to the Gulf of Mexico, and from the Alleghany to the Ozark mountains which are gritty mountains, while the basin itself is of very ancient limestone, altho' quite horizontal, but often covered with hills of slate, coal and sandstone.

Prof. Brongniart has mentioned some of the fossils which I sent him in 1820 from this region, (*Terebratula, Shophomenes, Favosites*) which had on them silicious orbicules. I could add many more as I have seen several others on *Turbiniolites, Orthoceratites*, &c. My *Cyclorites turbinolia* covers all over one of the first. I consider it like all my cyclorites of the S. G. cyclepite as parasite animals become fossils along with their support. Among my G. *Cyclorites* published 1819, and a complete monography in 1831, there are some flat and fixed, others fixed branched, free and simple with 1, 2 or several orders of circles. While in my G. Fibrillites, the whole is striated in the interior as in the *Tethya* of Donati and my G. *Bolactites*.

Yet I do not doubt of the globular and circular cristalization of the silex. Far from it, I have always believed in it for 30 years past, even when hardly any mineralogist could believe it. Besides the mamillar and oculated calcedonies and agats, I have seen jasper, onyx, cornelian, quartz, and chert, &c. with cristals either mamillary or hemispherical or lenticular. I have several specimens in my cabinet, such as red jasper, blue and white onyx, &c. I should therefore be inclined to believe that some of the orbicules mentioned or figured by Brongniart are orbicular cristals; but there are some, which with my cyclorites, fibrillites and others omitted, have the appearance of being animal fossils of ancient pelagic alcyonites, become silicious, like nearly all the fossils of the ancient limestone of Kentucky, Ohio, Tennessee, &c.

It appears that the geologists do not yet know well this fine region of fossils whose oryctology was first explored by Clifford in 1814 to 1820, and next by myself in 1818 to 1826. Maclure has designated all the region west of the Alleghanies as secondary, and James calls the same transition. Brongniart appears undecided whether it is transition. In fact it is neither strictly the one nor the other! America is not always similar to Europe in all the formations and strata. It has neither chalk nor lias? The Oolites and clays are often out of place! The ancient or pelagic limestone of this region as well as the slates and grits which surmount them are of transition by their appearance and ancient tribes of fossils; but they are similar to the secondary of Europe, by the horizontal position of the strata, and the silicified fossils like those of the chalk. They form therefore a kind of peculiar series, deserving perhaps a peculiar name, since the English appellation of mountain limestone or carboniferous limestone do not properly apply; they do not form mountains, but inferior horizontal strata, and do but seldom bear the coal. I have called it compact when it is nearly homogeneous and *specular* when it has a shining lamular fracture, &c. The fossils are disseminated in it very unequally, being sometimes very rare, but accumulated in some localities. Some species are very abundant and others very rare. Their great antiquity is proved by the ancient tribes to which they chiefly belong, Madrepores, Milleperes, Turbinolites, Favosites, Terebratulites, Encrinites, Alcyonites, &c. with some Trilobites and Cephalopodes.

But the most striking fact consists in the complete silicification of all these fossils of nearly 1000 different species. Most of them are casts of destroyed animals replaced by a silicious matter. This is constant in the limestone, except in the newest and uppermost, the shaly

limestone, which covers the oldest in some places, or elsewhere is under the sandstone or slates. The same happens in the long but narrow formation of limestone called transition, which borders on the mts. Alleghany to the East dividing them from the primitive hills. The Trilobites and Terebratulites, &c. are there also silicified. While in the limestones of New-York N. of the Alleghany, or superposed to the E. of them, the fossils are nearly all calcareous. And in the vast marl region from Long Island to Florida along the sea, all the fossils are calcareous or marly. A few later fossils of Kentucky, &c. not silicified, are chiefly found in marly formations.

The fossils of this central region can therefore be known at first sight when seen silicified in limestone. Thus the cyclorytes and silicified alcyonites may well be animals likewise. This becomes very clear when many of them are seen, which approximate to living animals of the Tropical seas and Mediterranean.

As a striking instance I add the descriptions (and figures in the original) of 2 N. G. of mine from the sea of Sicily.

1. *Psadiroma rubra*, Raf. Analyse Nat. 1815. Family of Polactomes—Animal fixt upon shells, fleshy red, smooth, elliptic, flattened, margin irregular, many flexuose concentric strias, centre with an expansible mouth without tentacula.

2. *Peritrema lobularis*, Raf. disc. 1807. Family of Alcyons.—Fixed on rocks, lobed, compressed, fleshy, brownish, with many rings on the surface, having a hole or pore in the centre.

These two animals appear to represent the ancient cyclorytes of the pelagic world; but many more exist yet in the seas.

It will therefore be needful to distinguish with care among the silicious fossils with simple forms, those which are really inorganic, such as the orbicules, spirozoites, annulites, globulites, mamillites, lentilites, &c. and the organic fossils; such as the fibrillites, cyclorytes, bolactites, granulites, &c. which may resemble them, and also the geodes from the geodites. If the silicious orbicules, &c. were always minerals, they should not be so rare, but common as the cristals inside of silicified shells. Out of thousands of silicious fossils which I have examined, I have only found cyclorites upon a small number. I have hardly ever seen any spiral epizoites and very seldom nodulose orbicules. But I have seen some radiated, and others with small circles within larger ones. The variety is great. If the free cyclorites were only orbicules they should not be so rare. Some are totally changed in calcedony, they should then be deemed circular calcedonies; but they are very different from the mamillar, and occulated calcedonies. Yet I was right to say that the fossil alcyonites, form as it were, a link between animals and minerals, as they approximate in shapes; but my fibrillites (decidedly organised animals) proves the animality of many others gradually linked by the forms. C.S.R.

Philadelphia, 2d April, 1832.

Note.—The tendency to silification of all animal substances is so very great in the western strata, that even parts of bones and horns of quadrupeds have been found partly silicified outside. I have in my cabinet a remarkable instance of it in the fossil horn of my *Mazama salinaria*, which is intact inside, but partly silicious outside: although this fragment was in a late formation, not in a stratum, and belongs to the latest age of fossil animals.

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15. *Remarks on the Geodes and Geodites.*

Every hollow mineral with cristals inside has often been called Geode. Patrin, ever since 1803 in the article Geode of the Dict. of Nat. Hist. has very well distinguished the volcanic Geodes, from the Geodes of the chalk, which last he deemed fossil animals.

Our ancient limestone agrees also with the chalk by having similar geodes; but there are two very different kinds of Geodes in our ancient limestone. Some like those of the Niagara lime stone,

which Eaton has called *Geodic limestone*, contains great many cavities similar to the volcanic Geodes and filled with cristals, while in Ohio, Kentucky &c. and chiefly in the Wasioto or knobhills, the cherty limestone and even the sandstone above it, contain many *free geodes* perfectly silicified like the other fossils, filled inside with fine cristals of quartz. These geodes which I have called geodites in my enumeration, appear to me to be fossil animals, like those of the chalk distinguished by Patrin. They are always thick, often smooth, without cyclorites or orbiculites. Some are very large, I could have collected many, but they were too heavy to carry. They are often found abundantly in the ravines, glens, and torrents of the hills, mixed with rolled stones. I have seen some calcedonised. It is sometimes needful to break them to ascertain their geodic nature, as the outward appearance is delusive.

But if they were animals, as they have no visible mouths, they must have been *porostomes* become fossils. See my letter to Cuvier upon the porostomes.

They will always be easily distinguished from the chert and silicious fragments of jasper, quartz, &c. imbedded in the cherty limestone by not being in any way angular, nor ringed.

Many kinds or species can be distinguished among them, but they often run into each other by gradual forms or colors. The G. *levigata* of my enumeration, sp. 74, would probably include many such. The colors are variable, but chiefly uniform in each specimen, the whitish, yellow and rufous are most common, but various shades of red and brown are also found. The sizes vary from that of an orange to the size of a man's head, weight from 1 to 25 pounds.

The following kinds offer the most striking forms.

1. *Geodites levigata*, Raf. Commonly a little elliptical, not compressed, nearly smooth.

2. G. *Compressa*. Elliptical, compressed one side smoother than the other.

3. G. *Sulcata*. A little elliptical, with some furrows or wrinkles unequal and irregular.

4. G. *Globosa*. Globular, smaller than the others, a little rough.

5. G. *Phaiops*. Oblong, nearly smooth, dark brown.

6. G. *Ovoidea*. Ovoidal smooth, one end smaller.

7. G. *Mamila*. Elliptical, somewhat mamillar outside.

8. G. *Erythrea*. Red, oblong, smooth.

9. G. *Divisa*. Oblong, with a partition in the cavity inside.

10 G. *Biloba*. Oblong, bilobe, with two rounded parts nearly equal.

11. G. *Lobata*. With many unequal irregular lobes.

12. G. *Elongata*. Long oblong, nearly cylindrical, smooth.

13. G. *Cavernosa*. Irregular with several cavities.

14. G. *Amorpha*. Amorphous, unshapely, a single cavity.

15. G. *Dispar*. Oblong, with a large chink on one side.

16. G. *Turbinata*. Nearly turbinate, rough, one end attenuate, the other convex depressed, cavity small. Very singular sp. fulvous uneven outside, inside changed in white quartz, cavity within with mamillar crystals.

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16. *On the Cavulites and Antrosites.*

My N.G. Cavulites follows the geodites in my enumeration. It differs chiefly by having outward cavities or openings to the internal cavities. The cavulites which contain as many sp. as the geodites, are not therefore *porostomes*, but may be true alcyonites or spongites having mouths or openings to the internal stomach or cavity.

Another N. G. of mine, which I call *Antrosites*, forms the link between them. It has no outward cavities, but a single large opening or hole communicating with the internal cavity. A living sea G. of Sicily called by me *Megastoma* in 1814 comes very near to this, but here the opening is still larger and the body is fixed not free. This *Megastoma* is however a very singular animal. It is called *cedru di mari* or sea citron in Sicily, resembling outside a large citron rough or somewhat mamillar, inside quite smooth, substance thick cartilaginous. Fixed on rocks nearly inert, yet alive, since when cut it appears to shrink from the knife.

The cavulites and antrosites have many species, of as many colors as the geodites; but their size is always smaller, and they are more rare, some sp. very much so. I shall give here a few of them: but figures should be required to make them well known; they will be figured hereafter.

1. G. *Cavulites*.

1. C. *ambloides*. Subglobose, outward cavities small and unequal, few inside and small.

2. C. *anastoma*. Oblong, cavities almost anastomosed, large cavities inside.

3. C. *geodica*. Ovoidal, large cavities outside, only one inside, hardly communicating.

4. C. *unica.* Elliptical, a single cavity inside, few outside unequal, one united to the interior.

5. C. *vermicularis.* Unshapely, with vermicular cavities outside and inside.

6. C. *amorpha.* Unshapely, cavities rounded unequal.

7. C. *equalis.* Subglobose, cavities nearly equal, few inside.

8. C. *depressa.* Elliptical compressed, cavities unequal, only one or two inside.

2. G. *Antrosites.*

1. A. *globosa.* Globular, surface nearly smooth; small opening, large cavity.

2 A. *elliptica.* Elliptical, surface a little rough, opening at one end, large cavity.

3. A. *camerata.* Ellipsoidal, surface nearly smooth, opening lateral, cavity divided by partitions.

4. A. *depressa,* Ellipsoidal, depressed, nearly smooth, opening very small terminal.

5. A. *nodosa.* Rounded surface, knobby or mamillar, opening small, cavity irregular.

6. A. *magna.* Amorphous rough, uneven, opening large, cavity lobular.

7. A. *dispherica.* Formed by two united lobes rounded, nearly smooth, opening irregular.

8. A. *rimosa.* Ovoidal with many chinks, opening and cavity large.

9. A. *incurva.* Oblong curved irregular, opening terminal, cavity small.

10. A. *ditrema.* Oblong nearly smooth, two unequal openings, one at each end, cavity large. This last ought perhaps to form a peculiar genus, by having two openings, and be called *Ditremites levis.*

All these animals or fossils are entirely silicious like the geodites. The *antrosites* have often cristals inside, but the *cavulites* very seldom. They are from the same locality and chiefly from East Kentucky.

17. *On the Genera of fossil* TRILOBITES *or* GLOMERITES *of North America.* BY C. S. RAFINESQUE.

Philadelphia, May, 1832.

Prof. Green of Philadelphia, is engaged in the investigation of all the Trilobites of the U. States; a labor very much wanted; as these interesting fossils are very numerous with us, and but few as yet properly named and described. Instead of figures he will give colored casts in plaster of all those he can procure. This improvement is novel here and will be very acceptable to the oryctologists. He has already issued in April a first series of 8 casts and species accompanied with a synoptical table, among which a N.G. *dipleura* and 4 new species of G. *asaphus* and *calymene.* He has omitted the geological localities, but will probably supply this deficiency in his monograph.

I was among the first to attend to the trilobites in N. America. In 1817 Dr. Schæffer presented the first specimen from the Catskill mts. to the Lyceum of New-York, as a fossil quite unknown. I pronounced it a new genus of fossil entomostraceous crab, and called it *Glomerites eurycephala* in a paper read before the Lyceum; being very near to the G. *glomeris* of Latreille or *armadillo* of Cuvier.

Soon after I found in the work of Parkinson, that he had been the first to notice these fossils, under the name of *Trilobites,* a very good and precious name.

Brongniart in his excellent work on the trilobites, published in 1822, but which he claims to have read before a society in 1815; divides them into 5 genera, and abolishes without just cause the name of trilobites; which ought to have been left to the group *calymene:* and must yet be restored, because there is a previous G. *calymenia* of Ruiz and Pavon in botany.

Much discussion and controversy has taken place on the subject of these animals, some deeming them shells near to *chiton;* but the presence of eyes in many of them fixes them among the crabs; altho' their feet being small and soft, have been obliterated in the fossilization.

In 1821, I sent to Europe the description of 12 American trilobites, and I published in Kentucky the N. G *Iso ctomesa.*

In 1824 Dr. Kay produced it again under the name of *isoteles* and in 1826 Dolman calls it *nileus.*

Dolman has described many European species; we have nearly as many in North America, offering

many striking generic distinctions. As far as I know them they must form at least 15 genera, and 4 series of beings, with many, two, one or no eyes.

I. Series or Section. More than two eyes. POLYOPSITES.

1. G. ALLOCTOPS, Raf. 1821. Trilobate not glomerate, head with 8 unequal eyes in 2 longitudinal rows. Thorax and abdomen with many segments. 1. A. *flexuola*, Raf. about 20 flexuose segments, fore eyes smaller, tail a little jutting obtuse. Cabinet of Transyl. University, from old limestone of Kentucky.

2. G. DIPLOPSITES, Raf. 1821. Not trilobate nor glomerate, head with 4 eyes double on each side. Thorax and abdomen with many segments, 1. D. *levis*. Very smooth, eyes equal. An imperfect specimen in the Cincinnati Museum, from Ohio.

3. G. TOMOLIGUS, Raf. 1821. Not trilobate but glomerate, head very broad, 2 large eyes cut in two lengthways. Thorax with few segments, 4 or 5, abdomen large entire, Type. 1. T. *mimulus*, 1821, (or my *trilobites simia*, enum. 1831.) Smooth 2 furrows before each eye. Cabinet of Clifford, found in Salt River Knobs.

II. Series or Sections. With two eyes.—DIOPSITES, Raf.

4. G. ISOCTOMESA, Raf. 1821. *Isoteles*, De Kay, 1824. *Nileus*, Dolman, 1826. Not trilobate nor glomerate. Head and abdomen large entire, 2 distant eyes. Thorax with 8 equal segments. Type 1. T. *emarginata*. Eyes round, abdomen larger than the head, retuse or notched behind. Cabinet of Trans. University, presented by Judge Bledsoe, found near Harrod's Lick and Paris in Kentucky, in old limestone. The largest trilobite known, being 9 inches long and 4 broad. Different from the I. *gigas* of De Kay, which has bilobed eyes and is not notched. I. *plana*. D. and other sp. belong to this genus also. The G. *Ilenus* of Dolman, hardly differs having only 9 or 10 segments to thorax it may form a sub-genus

5. G. DIPLEURA, Green, 1832. Not trilobate, subglomerate, 2 oblique eyes, thorax with 14 segments, abdomen or tail orbicular. See Green's series No. 3.

6. G. ASAPHUS, Br. 1822. Trilobate, not glomerate. Abdomen or tail expanded large, without segments. Thorax with many segments. Many sp. see Brongniart and Green.

7. G. TRILOBITES. Park. 1812. *Glomerites*, Raf. 1817. *Calymene*. Br. 1822, and Green, 1832. If the name trilobites is not to be generic, *calymene* must be changed nevertheless for *diopsites* or *geoplaxis*, Raf. many sp. I descr. 2 in my enum. T. *eurycephala* and T. *granulata*. Green has 5 sp. in I. series, of which 3 new; but his pretty C. *calicephala* ought to form a sub-genus *Orimops*, Raf. by eyes annular or with a central dot, and head with a curious relief like a flower de Luce. The G. differs chiefly from *asaphus* by having the abdomen with segments or blended with thorax, and both glomerate.

8. G. TELESIOPS, Raf. 1832. Differs from the last, by head very broad, with remote lateral eyes, very large, prominent and reticulated. 1. Type. T. *leiocephas*, Raf. Head smooth, eyes reticulated by dots, flat and smooth above, thorax with 11 segments, lateral ribs duplicate, abdomen or tail with 7 segments flattened not duplicate. My cabinet, from Virginia, several sp. blended under C. *macrophthalma* of Br. must be united here, and probably also my T. *eurycephala* or *Telesiops granulata*. The T. *leiocephas* I have ceded to Prof. Green.

9. G. PROMENITES, Raf. 1832. Bilobites, Raf. 1821 and 1831, in enum. I have changed the name as there are several G. bilobites. 1. Pr. *lunula* Raf. 2. Pr. *bilobata*, &c.

10. G. OGYGIA, Brongniart.

III. Section or Series. Only one eye? MONOPSITES, Raf.

11. G. METAPTELES, Green; or MONOPSITES, Gr. or CRYPTOLITES, Gr. All these names proposed by

Green; he shall select probably the best. Singular G. without eyes? but with a big central knob like an eye, only the head known, trilobate, with a fine reticulated forehead. 2 sp. see Green's work.

IV. Section or Series. No eyes. ANOPSITES, Raf.

12. AGNOSTES, Br. 1822. *Batus*, D. 1826.

13. PARADOXIDES, Br. 1822. *Olenus*, D. 1826.

14. AMPYX, Dolman, 1826. Thorax with few segments, abdomen or tail expanded.

15. RETUSITES, Raf. 1821. Head retuse or bilobe, body trilobate with many segments, abd. not expanded. 1. Type. R. *levis*: Head short subbilobe, about 20 segments, middle lobe narrow. In Ohio.

It will be noticed that I have called head, thorax and abdomen, what others call clypeus, abdomen and tail: my view has more conformity with the living genera, and whatever bear eyes must be a head.

18. *On the Salses of Europe and America.*

Spallanzani gave the name of salses to the mud volcanoes of Italy, which commonly throw out salt water at the same time. This name has been properly applied as a generic name to all the volcanoes which throw mud, slime, clay, marl, lime, sand, &c. instead of lava, stones, gravel, pumice, cinders, obsidian, &c.

Water, air, gases, fumes, sulphur, iron and many other substances, are common to all the volcanoes, of which there are at least 4 series. Earthquakes, heat and fire, are more or less common to all in some of their paroxysms. And all the volcanoes exist within two peculiar fluids, air or water. The Aerial volcanoes or salses are those acting in the atmosphere, the aquatic volcanoes those existing under the water of the sea.

The 4 series of volcanoes are,

1. Trachytic or lavic volcanoes: such as Etna, Vesuvius, both aquatic and aerial.

2. Basaltic volcanoes, ejecting basalts and traps commonly aquatic.

3. Carbonic volcanoes, ejecting coal and slates; always aquatic.

4. Salsic volcanoes or salses. These are both aquatic and aerial. Many are yet existing; but they were much more numerous in ancient times, when the sea covered most of the land.

They are found all over the world, but those of Asia, Africa and Polynesia are little known as yet. Those of Europe have only been observed within 50 years, and those of North America by myself within 16 years.

The principal salses of Europe are now

1. Those of Italy, in Modena, the Apennines, and Roman States.

2. Those of Sicily; *Macaluba* visited by Dolomieu and myself is the most famous, as having sometimes firy eruptions, although ejecting only clay. But there are many more in Sicily ejecting clay, sulphur, magnesian marl, &c.

3. Those of Crimea, described by Pallas.

4. Those of Poland, producing mud and salt.

5. Those of Iceland, called Geysers or spouting springs, producing many earths and even silex.

6. Those of Murcia in Spain, near Orihuela. Quite lately sprung in 1829, with dreadful earthquakes, but no fire. A square of 64 miles circuit was desolated and all the villages destroyed. The ground was filled with clefts and millions of small craters, throwing out sand, black liquid mud and sea water, mixt with sea shells! and sea weeds! (see the Descr. in Bulletin of Geography of Paris.) This great eruption of our times is a complete proof of the volcanic formation of many tertiary strata and even sandstone strata, or strata with organised fossils.

Two other recent instances of volcanic eruptions of mud and earths, will be given as additional proofs.

In 1822. The mountain Galungun, near Cheribon, in Java, had a dreadful eruption with explosions, earthquakes and lightnings; but no fire, no flame and no lava. It rained ashes and hot mud, with earth and stones, which formed a stratum 70 feet deep, 20 miles long and 10 wide, overwhelming 114 villages, and destroying 4000 men.

In 1831 and 1832, some of the volcanoes East of the Andes must have had earthy or muddy eruptions, since the earth, dust, and mud, was carried easterly 1000 miles to Buenos Ayres, in black clouds, by the winds, as was stated in the periodicals, unless we admit that it was formed in the clouds.

These salsic and muddy volcanoes in fact exist every where; but have periodical or remote eruptions. When they are small, they pass unnoticed, as many have which exist in England, France and Germany; being mistaken for curious springs or casual phenomena. But these small local effects and formations are exactly what geology seeks as remains of former more powerful agents.

I have sought for them in North America and had no difficulty to find them. They exist every where in the secondary and tertiary regions. Many belong to remote aquatic formations and eruptions; but several exist in actual activity as aerial salses, with craters, throwing many earthy and saline substances.

Out of 100 interesting localities of this kind, which I have visited, I shall here mention a few.

1. SALSES of New-York, at Saratoga, Saline, Syracuse, Montezuma, &c.

2. Those of the great lime valley extending from New-York to Virginia east of the Alleghany.

3. Those of the Alleghany mts. Catskill, &c. with very ancient craters that threw sand or psamite formations, sometimes become lakes.

4. Those of Cumberland and Wasioto mts. of Virginia, Kentucky and Tennessee. The hollow mountain is a singular psamite crater in it very ancient.

5. Those of the Ohio basin, in Ohio, Kentucky, Tennessee, Illinois, Indiana. Very numerous and various, of different ages and periods, called licks, salines, springs, &c. Such are Bignob licks, Harman licks; mud licks, yellow springs, &c. which will be described in my account of the licks.

6. Those on the Mississippi, or west of it, are very numerous also. In 1811 and 12, they had dreadful eruptions forming lakes and clefts, craters, new strata as in Murcia.

All these throw out as yet periodically, earths and salts, gases, mud, clay, iron, lime, marl, bitumen, sand, &c. and continue to increase some smaller or local formations of those substances.

The account of these salsic volcanoes will be continued in other papers; and the carbonic volcanoes of North America will be described in my memoirs on the coal mines of North America.

C. S, Rafinesque.

19. *On the* Lamellites *N. G. of American Fossils.*—By C. S. Rafinesque.

Among several fine fossils of the cabinet of Prof. Green, which I have added to mine by exchanges, I have found 2 sp. of a N. G. of POROSTOMES, or animals without mouths, in a fossil state. I was right to announce that the fossil porostomites would soon increase in number

I have called this N.G. *Lamellites* owing to its internal lamellar structure, whereby it is related to my bolactites, fibrillites and the living tethya. It differs chiefly from this last by its solid centre and smoother outside, without cuticle. Both species are from the State of New-York, near Glen's falls in the old limestone of that region, somewhat similar to the transition of the long valley; but of a darker hue; nearly black with a bluish cast.

They are not silicified, but petrified, into the hard limestone, and can be scratched by iron.

G. *Lamellites*. Body free without a cuticle outside; lamellar in a radiating form around the circumference, centre solid not lamellar, but the lamellas radiate from it.

1 sp. L. *bilobata*, Raf. Oblong, nearly bilobe, or middle contracted, ends rounded. Surface a little uneven, lamellas, elongated, solid centre small. Fine large heavy and hard fossil, 4 inches long, blackish, with some roughness and pits outside, some white spots inside.

2. sp. L. *depressa*, Raf. Discoidal, depressed, nearly smooth outside, lamellas short; solid centre large. Smaller, diameter over one inch, softer and of a paler bluish cast.

The figures of these and 500 other fossils will be given in my Iconographical Illustrations.

PHYSICAL GEOGRAPHY.

20. *Licks and Sucks of Kentucky.*

By C. S. Rafinesque.

The enumeration of these places properly belongs to Physical Geography, their ultimate history to Geology.

Their geological name is SALSE. They are found all over the Western States, and even in Western Virginia and Pennsylvania; but are most numerous in the Central State of Kentucky. They were called LICKS by the first settlers, because they noticed that buffaloes, elks and deer went *to lick* the saline ground, and SUCKS when they went to suck or drink the saline springs or pools of the salses. The French settlers called them *salines;* this name has been partly preserved in New-York, Canada, Illinois, and Missouri.

Nearly 100 licks are noticed in the large map of Kentucky by Munsell; but I have seen or heard of 60 more. They may be divided into 3 series.

1. *Salt Licks*, producing saline efflorescences or salt springs and pools. In summer the springs are often dry, but the saline particles

exist in the soil. Altho' sea salt is the most common, yet several other salts mixt with it, Epsom and Glauber salts, &c. or many sulphates and muriates. Few licks afford the pure muriate of soda.

2. *Sulphur Licks.* Those where sulphates and hydrogene predominate, rendering the soil or water fetid.

3. *Clay Licks.* Where clay or marl chiefly abounds; often partly saline, and licked by wild beasts or tame cattle. The paint licks have colored ochres.

Nay, these 3 kinds of licks are often near each other; at mud licks for instance, 4 springs, salt, sulphuric, vitriolic and chalybeate are found. But chalybeate springs are not called licks, because the cattle do not lick them.

The licks are known at first sight by their barrenness, as little grass, few plants and fewer trees, grow among them, being commonly destitute of soil, and forming therefore many small barren spots among the fertile lands of Kentucky, from 100 yards to one mile or more in extent. But few are stony; they are generally formed by a thick stratum of clay, from 3 to 100 feet high, raised in heaps, slopes, hills or hollows: perpetually washed by rain into gullies or clefts, by the unshaded heat of the sun.

To enumerate them properly, as counties are yet fluctuating in Kentucky, I have disposed them in 7 groups, according to their situation near streams.

Enumeration of all the Licks of Kentucky.

I. Group. Near the Ohio river.

1. Salt lick near Vanceburg and mouth of Salt Lick Creek.

2. Bank Lick near Covington and Bank Lick Creek.

3. Briarpatch Lick on Stony creek, N. of Burlington.

4. Sand Lick on creek do. opposite mouth of Miami.

5. Double Lick on Woolpers cr. & do.

6. Bigbone Lick on creek do.

7. 8. Mud Lick and Upper Lick on mud cr. near last.

9. Paint Lick on creek do. S. of 6.

10. to 12. Flat Lick, Fern Lick and Belger's Lick, on Fern or Pond cr. S. of Louisville.

13. 14. Mann Lick and Elk Lick, S. of those in the knobs.

15. 16. Clover Lick and Tar spring Lick on Clover cr.

17. to 20. White Lick and 3 other on Highland cr.

21. Clear Lick, at fork of Clear cr. and Tradewater cr.

II. Group.—On the two Sandy Rivers.

22. 24. On branches of Big Sandy. Rummer Lick in Beaver cr. in knobs, Cats Lick and Bigpaint Lick on the cr. bearing their names.

25. 26. 27. On Little Sandy, 3 Salt Licks. Little Sandy L. Grayson L. Berret Lick. Much salt made.

III. Group.—Licks on Licking river, which took its name from them. All in the limestone region.

28. 29. On North fork, May's Lick, a salt stony lick, and Stone Lick at the head of the fork.

30. Grant Lick on Philips' cr. branch of main fork.

31 to 37. On Middle forks. Upper and lower Blue Licks, salt and stony. Cow Lick and Slate Lick on Cow cr. and Slate cr. Mud Licks or Olympian Springs, 4 springs as stated on a brook. Station Lick and Burning Spring Lick near the head.

37 to 47. Ten Licks on south fork. Fork Lick on Forklick creek.

Four Licks below Cynthiana.

Harrod's Lick on Harrod's cr. above Paris.—2 Stone Licks on Stoners fork.

Carlisle Lick, one mile W. of Carlisle on Lick cr.

Hinkston Lick on Hinkston fork.

IV. Group.—Licks on the Kentucky river and branches, beginning near the head.

48. Burning Spring at the source of Burning Spring fork of South fork.

49 to 53. Five licks near Manchester and South fork, all Salt Licks, where much salt is made. Collins Lick, Goose Lick, Outlaw Lick, Elisha Lick, Redbird Lick.

54. Estil Springs and Licks near Irvine.

55. Salt Lick near mouth of Troublesome cr.

56 to 59. Red Lick, Blue Lick, Copper Lick and Rock Lick on 4 forks of Station Camp Creek.

60 to 64. Paint L. White L. Big and Little Harman Lick, Button Lick, near Paintlick cr.

65. 66. Silver Lick and Rocky Suck on Silver cr.

67. Stone Lick S. of Frankfort.

68. Glen's Lick E. of Frankfort 1 mile.

69. Cedar Lick on Cedar cr.

70. Clay Lick on the Kentucky E. side

71. Drennon's Lick on Drennon cr. W. side.

72. 73. Deer Licks on Mill creek.

74 to 79. Near Dick River, 6 Licks. Big knob Lick the most remarkable, a fine salse of marl of late formation, nearly 2 miles round, with craters, &c. Little knob Lick at head of Knoblick cr. East Knoblick on Lick branch. Shelby Lick on Knoblick cr. Fall Lick on Fall cr. Boon's Lick between Mt. Vernon and Crab orchard has salt wells.

80 to 87. On Red River, 8 licks or more, all in the Knobs. Alum Lick and Iron L. near the iron works. Catamount. L. Red L. &c. above them.

88 to 92. Near the Elkhorn cr. Buffaloe stamping ground. Sulphur Springs. Elkhorn Lick on North Elkhorn. Lane's Licks 2 or Lane's run.

93, 94. Big Lick and Spencer Lick on Eagle cr. near each other.

V. Group.—Licks on Salt River and branches.

95. On Lick fork of Floyd cr.

96. Long Lick on Longlick cr.

97. Bullit L. on Bullit cr.

98, 99. On Simpson cr. 2 Licks.

100, 101. Dry L. and Harrod's L. near Harrodsburg.

102 to 105. Several licks or branches of Beechfork.

105 to 110. Several on Rolling fork in the knobs chiefly. Falling run L. Pine L. at head of Pottinger cr. Two sulphur L. N. and S. Salt L. on Salt run near Muldraugh hill. Cedar L. between New Lebanon and New-Market.

VI. Group.—Licks near Green River and branches. From the head to the mouth.

111. Long L. near the source, giving rise to Long branch, and also to a branch of Ditk R. in the Knobs.

112, 113. Mocassin L. two near head of Green R. and Mocassin cr.

114. Pine L. on cr. same name.

115. Locust L. on Locust run of Pitman cr.

116. Rock L. on Brush cr.

117, 118. Elk L. a dripping rocky lick, and Sulphur L. both on Little Barren R.

119. Clay L. at the head of Bear cr.

120 to 122. Wolf, Duck and Elk L. on 3 forks of Muddy River.

123. Alston L. on Alston cr. branch of Pond cr.

124. Otter L. on Otter cr. branch of Pond cr.

125, 126. Long L. and Sulphur L. on two branches of Rough River.

127. Big L. on Panther cr.

128, Deer L. on N. fork of Deer cr.

The following are on the branches of Big Barren River.

129. Wolf L. on Wolf fork of Gasper R.

130. Gasper L. on Gasper R.

131. Black L. on Blacklick fork of do.

132. Clay L. below Bolingreen.

133 to 135. Salt L. on Drake cr. Salt made. Sulphur L. and Trummel L. on forks of Drake cr.

136, 137. Licks on Noble cr. and Difficult cr.

139, 140. Two licks near Chaplintown and Saltpetre cr. and cave.

141 to 144. Four Licks on East fork of Big Barren River.

VII. Group.—On the waters of Cumberland River in E. Kentucky in Knob hills chiefly.

145. Hollow L. at the source of Cumberland River, near the Hollow mt. in Cumberland mts.

146. Yellow L. at head of Yellow cr. near the Cumberland Gap.

147. Morgan L. on Cumberland between mouths of Laurel and Rockcastle Rivers.

148. Flat L. on Stinking cr. E. of Barboursville.

149. Raccoon L. in Knobs at head of Richland cr.

150. Flat L. on Buck cr. to N. E. of Somerset.

151. Fighting L. at the forks of Fighting cr.

152. Rennick L. above Burksville.

153. Salt L. in Saltlick bend S. of Burksville.

154. Sulphur L. on Sulphur cr. branch of Ohio River.

155 to 160. Six Licks near Rockcastle River. Round stone L. on cr. ditto, N. of Mt. Vernon. Double L. and Horse L. on Horselick cr. Birch L. Indian L. and Laurel L. on Laurel fork of Laurel R.

Some other nameless Licks may exist in Kentucky. When very small or quite dry, they often pass unnoticed, and many Sucks are now called Springs. I have seen many such which it would be tedious to detail.

Licks become Sucks sometimes in the Winter and Spring, in rainy weather: and many Sucks become Licks in the dry season. Some mineral springs were formerly sucks, such is the Cameleon spring in the knobs near the Mammoth Cave. Deer and Cows now frequent the Licks to lick the ground.

The Spouting Springs and Burning Springs of Kentucky although

commonly connected with the licks, are but few and peculiar phenomena.

The description of the most remarkable Licks will be given hereafter in a geological Essay. Although few are alike in extent and form, they have nevertheless many things in common.

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21. *The two Highest Mountains of America.—By Pentland.*

They are both in South America and in Bolivia.

1. Mount Sorata, East of Lake Titicaca is 25,250 feet high: the highest in America; but yet lower than the peaks of the Imalaya in Asia. Peak Javaher is 26,745 and others from 27 to 28,000.

2. Mount Illimani, East of City Lapaz is 24,350 feet high, and the second highest in America: while the famed Chimborazo, once thought the highest on earth and lately the highest at least in America, is at best the third in rank, being only 21,425 feet high. Perhaps other higher yet are to be found in Bolivia and Chili.

Pentland in 1825 measured the mountains and heights of Bolivia, and found them higher than those of Quito, near the equator. The highest land of America is to the S. of it, while in Asia it is N. of it.

This discovery upsets all our boasted calculations and physical views of mountains; which must be amended as well as our geographical school books.

Another discovery of Pentland destroys the whole of Humboldt's fanciful theory of gradual limits of congelation and perpetual snow. Thus every learned theory in geology is gradually destroyed by facts.

On the Andes of Quito at the equator the perpetual snow is found only at 15,749 feet. While in the Andes of the Bolivia, between 18 and 19 S. of Equator, the perpetual snow is found only at 17,061 feet! by the theory it ought to be at less than 14,000! at which height are found villages and vegetation.

The post house of Ancomarca inhabited 4 months in the year, is at 15,722 ft. above the sea. The village of Tarura at 14,252 feet.

The city of Potosi is at 13,314 feet, the mines at 15,912.

City of Chucuito at 13,025 feet.

The Lake Titicaca inhabited all around is at 12,703 feet. The table land of Tajora W. of it 18,898.

Lapaz, the largest city of Bolivia, at 12,195.

While in Mexico at 18 to 19 d. N. of the Equator, all vegetation ceases at 14,075 feet.

The Imalaya mountains of Asia evince also that other causes besides latitude and elevation, influence the climate, heat, vegetation and congelation; since in latitude 20 to 30 N. cultivation extends as far as 17000 feet above the sea, and perpetual snow begins only at 20,500 feet, according to Dr. Gerard's observations.

TELLUS.

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22. *Scientific Explorers of North America.*

1. Mr. Lutner, a Botanist and Entomologist, from Stutgard in Germany, has travelled last year through New-York, this year in Pennsylvania, and he is now gone to explore Carolina and Georgia. He expects to be sent next year to Australia by the Botanical Society of Stuttgard.

2. Mr. Gates has explored for two years past Louisiana, Mississippi and Alabama, at the expense of several gentlemen, chiefly in New-York. He has collected for them many plants, shells, fossils, and other objects.

3. Capt. Wyeth with a company of adventurers from Cambridge in Massachusetts, sent by the Pacific Fur Company, have departed this year to explore the Oregon Country, where they are to spend five years in hunting and trading. It is said they have a Mineralogist and Zoologist among them; but their names are not given.

4. Prof. Rafinesque has been one of the earliest scientific explorers of North America. He has travelled for 20 years as a Botanist, Zoologist, Geologist, Geographer and Archeologist, from 1802 to 1804, and from 1815 to 1832, in the following States and places.

1802. Pennsylvania and New Jersey.
1803. Ditto and Alleghany mts.
1804. Delaware to Cape Henlopen, East and West Maryland, Virginia, Alleghany mts. of Pennsyl. and New Jersey.
1815. Connecticut and New-York.
1816. New-York, Lake Champlain, the 4 falls of Hudson, Vermont, &c.
1817. Mattawan mts. Catskill mts. Long Island, Connecticut, &c.
1818. Pennsylv. mts. Alleghany River Ohio to Wabash, West Kentucky, Indiana, Illinois, Ohio and Pennsylvania.
1819. Maryland, Potomack, Allegh. mts. River Ohio, Central and East Kentucky, Knobhills, &c.
1820. Central and East Kentucky.
1821. Kentucky, Ohio, Miami, &c.
1822. Central Kentucky.
1823. West Kentucky and Tennessee; East Kentucky and Cumberland mts.

1824. Central Kentucky.
1825. Ohio, Western and Northern Virginia, Maryland, Pennsylv. Kentucky, &c.
1826. Ohio, Lake Erie, Falls of Niagara, Canada, New-York from Buffaloe to New-York, Pennsylvania.
1827. New-York, Massachusetts, Boston, &c.
1828. Allegh. mts. Lehigh, Schooley mts. New Jersey and New-York.
1829. New Jersey, New-York and Connecticut.
1830. Catskill mts. New Jersey, &c.
1831. Delaware, Taconic mts. &c.

TELLUS.

23. BOTANY AND HORTICULTURE.

Extracts of a letter from Dr. John Torrey of New York, to Prof. Rafinesque of Philadelphia, March 1832.

I have lately received some of your new plants from Ohio, and also from Kentucky, sent by Mr. Eaton. Your *Cladrastis* is certainly the *Virgilia* of Michaux, it must be separated from the Exotic Virgilias, and your name (of 1825) is a very good one.

Stylypus has interested me very much, the stipe changes in appearance in different periods of inflorescence.

Enemion is distinct from *Isopynun;* but the *I. thalictroides* of Germany may perhaps belong to it. Your *E. biternatum* I suspect to be the *Thalictrum clavellatum* of Dec. and Delessert Ic. t. 6. collected by Michaux; but without seeds; while the seeds make this genus.

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24. Description of a new cherry tree from the Oregon Mountains.

I noticed as early as 1829, in Washington Square of Philadelphia, a fine tree said to have been brought by Lewis and Clarke from the Oregon or Rocky Mountains. I ascertained that it was a n. sp. and sent an account of it to Decandolle in 1830. I call it *Prunus (Cerasus) rotundifolia.* Arborescent, leaves rounded, base often subcordate, end obtusely acuminate, margin serrulate. Flowers fasciculate, berries oblong small and black.

Descript. A fine large tree 20 feet high in 20 years growth. Bark very dark nearly black. Branchlets slender with a greyish brown bark, buds small rufous, with obtuse scales. Leaves like those of apricot, but much smaller, about one inch long, not so smooth, a little rough, but not pubescent. Blossoms in May and produces a profusion of white flowers with a fine smell of honey. The cherries are ripe in July, small, one fourth of an inch long, elliptical, looking like small wild plumbs; but black, soft and sweet when ripe. Good to eat, but if too many are eaten causing sickness in the stomach, like all the wild cherries. Stone oblong acute as in plumb, but without the 3 keels as in cherry.

I think that I have seen the same tree in West Kentucky in hills; but I did not see the fruit there. It may be found from Kentucky to Oregon. It is now naturalized in Pennsylvania, and may probably be improved by grafting. Birds and children are fond of the fruit. C. S. R.

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25. Account of 2 N. Sp. of Dionea or Venus fly trap.

This beautful genus was supposed to consist of a single sp.; but out of many plants brought from Carolina and Florida to our Philadelphia gardeners, I have detected 2 new ones *D. sessiliflora* and *D. uniflora.*

These are their respective characters.

1. *Dionea muscipula* L. Petioles cuneate broadly obcordate at the end; flowers corymbose, 4 to 9 on long peduncles, bracts linear.

2. *Dionea sessiliflora, Raf.* 1830. Petioles winged, oblong or subcuneate narrow, acute at both ends; flowers sessile, 3 to 5 aggregate, bracts lanceolate. Observed in the Botanical Garden of Macarran in blossom in May 1830. The true leaves are bilobe and ciliate as in the first, they also catch flies. Scape terete elongate, flowers white with short concave bracts. Divisions of the calyx lanceolate acute, Capsules

hardly longer oval acute. As pretty as the old sp. and will be a fine addition to our gardens. Brought from Carolina or Florida.

3. *Dionea uniflora, Raf.* 1830. Petioles oblong acute winged, Scape unifiore, bracts linear. Also from the same garden and place, perhaps a variety of the last; but smaller, leaves shorter and broader.

C. S. RAFINESQUE.

FRANKLIN TREE.
FRANKLINIA ALATAMA.

26. *New Plants from Bartram's Botanic Garden.*

BY C. S. RAFINESQUE.

The Botanic Garden of Bartram, at Kinsessing on the Schuylkill, 2 miles from Philadelphia, is the oldest establishment of the kind in N. America, begun over 100 years ago by the elder Bartram. It is yet in a very flourishing state under the management of Col. Carr and his son; very rich in rare Southern plants and shrubs. There have been naturalized in Pennsylvania, the Franklin tree, Gordon tree, Stewart tree, Bigleaf Magnolio, and several other Southern trees. In my Medical Flora several new plants were described from this garden. I now propose to give periodically the description of many others, which the liberal owner has allowed me to examine, describe, preserve and draw.

I may give their figures hereafter; meantime I give above that of the beautiful Franklin tree, which grows with the utmost perfection in this garden. The original tree brought by Bartram nearly 60 years ago is now nearly 40 feet high. All those in other gardens come from this tree. Their sweet white blossoms and orange-like leaves make them highly ornamental and prized.

1. *Veronica precox*, Raf. Stem diffuse compressed probescent. Lower leaves opposite, upper alternate, on short petioles, ovate-rounded, serrate-laciniate, trinerve. Peduncles axillary solitary longer than leaves, capsules compressed emarginate. Annual Vernal in March and April, lasting only a few months, Grown in the garden from seeds received from a place unknown; but has spread all over the garden like a weed, and even is become spontaneous on the banks of the Schuylkill. A pretty small vernal plant, with delicate large bluish blossoms.

2. *Veronica Sparsiflora*, Raf. 1830. Stem erect, simple round solid, leaves opposite sessile cuneate, oblong entire obtuse. Raceme terminal lax very long, flowers scattered, bracts linear oblong obtuse, pedicels filiform. Capsules bilobed subcompressed. Annual native of Arkanzas or Texas, received from Prof. Nuttall. Stem 1 or 2 feet high. Flowers vernal purpurescent, handsome. Corolle rotate, segments of the calix unequal oblong obtuse. A pretty ornamental sp.

3. *Cotyledon marginatum*, Raf. Leaves crowded patent sessile spatulate; oblong acute thick, convex beneath, flat above, margin acute brown. Scape terete with 2 or 3 small

leaves ovate acute. Flowers in paniculate spikes naked. Corolla campanulate, 5 fid 5 gone. Fine perennial green house plant received from Mexico. Blossoms in summer, corolla acute, saffron color. Scape nearly 2 ft. high, calix 5 parted acute.

4. *Maranta obliqua*, Raf. Petioles terete scabrous, leaves broad lanceolate, base oblique, end acuminate, lucid above, glaucous beneath, very smooth. Perennial from Florida or Brazil.

5. *Iris aurea*, Raf. Stem straight biflore, leaves longer broad ensiform, end acuminate falcate, flowers geminate beardless, 3 petals obovate entire, 3 lanceolate undulate, stigmas dilatated notched. Discovered by Mr. Carr in a pond of the Pocono Mt. in the Alleghanies of Pennsylv. Very near to *Iris pseudacorus* of Europe, which however has bifid toothed stigmas, &c. Large Iris 3 to 4 feet high, with scentless flowers of a bright golden yellow, smaller than in I. *pseudacorus*. The 3 inner petals shorter than stigmas, equal to Anthers, casules oblong deeply sulcate.

(To be continued.)

ARCHEOLOGY.

27. *Some Antiquities of Tennessee.*

By M. Rhea.

The following description of two ancient towns of the former inhabitants of Tennessee, was given us for publication by Mr. M. Rhea, the author of the late excellent map of Tennessee, with a geological section confirming our geological survey of Kentucky, and noticing a stratum of Oolite near the top of the Cumberland Mountains in Tennessee.

On the plantation of A. Long, Esq. 3¼ miles South of Columbia, in Marny co. Tennessee, are seen the remains of an ancient town or village, containing six or more acres. The form is elliptical, extending East and West. Surrounded on the South East and West by a wall of clay which terminates at each extremity in the neighbourhood of four springs of water, which rise from the foot of steep cliffs on the North side of the Village.

The interior particularly at the Eastern end contains the ruins of many houses of various sizes from 10 to 30 feet diameter, all of circular form. Throughout the whole Village graves are found in abundance, from one to three feet in depth, and containing human bones of all common sizes. The bodies seem generally to have been buried in a sitting posture, with flat stones placed around and over them. Cups and small ornaments composed of earth and shells are found with the bones. Several small hatchets of very hard stone, and of various shapes have also been found. Other small polished stones, weighing from half a pound to 2 pounds, designed from appearances for breaking nuts, are frequent.

No metal of any kind whatever has been found in or about this Village, although much search has been made.

Several of the forest trees growing on the spot, which were removed by the proprietor within the last few years, numbered upwards of two hundred annual formations. Some of these trees were found growing on banks formed by the uprooting of other trees of equal size and age. From which may be inferred that many centuries must have elapsed, since the population of the place ceased to exist.

Opposite the mouth of Big rock house creek on Buffaloe river in Perry county, Tennessee, are the remains of another large ancient Village, similar in general appearances to the one described. Near the Western side is a large mound, of an exact four sided rectangular figure, the lines of the sides pointing nearly to points of the heavens. The elevation is extremely regular, the height about ten feet, with a flat surface, and steep, almost perpendi-

cular sides. The exterior has not yet been penetrated.

28. Some Antiquities of Ohio.

Notwithstanding the long account of the monuments and ancient towns of Ohio by Atwater, in the Archeologia Americana, and my own synoptical account of the ancient monuments of North America; there are many more as yet unnoticed, of which I shall now describe two.

1. Near Alexandersville, 7 miles S. of Dayton in the Valley of the Great Miami river, the main road from Cincinnati to Dayton, which I travelled in 1826, crosses the site of an ancient town, of about 500 acres extent. It forms a perfect ellipsis, nearly one mile long, from N. to S. It is surrounded by a wall or embankment 25 feet broad and 8 feet high, without any ditch outside nor inside. It has 3 gateways to the East, West and North, this last is close to the River Miami, which has partly washed away the embankment. By its size and shape it could not have been a temple; but rather a town. I could see no mounds nor altars near it. It is very old, the walls being rounded, covered with soil and large trees.

2. At the mouth of Grand River on Lake Erie, where now stands the town of Fairport, stood about 50 years ago, an old Indian fort, exactly of a pentagone shape, with unequal sides, inclosing several acres. The wall was of rough stones, partly cemented, but covered with soil, and trees 300 old were growing on it. This account was given me by an old settler and is rather obscure. The stone wall, with a kind of cement is rather singular and doubtful. This may have been one of the forts of the Erigas or Erie's Nation, built for defence against the Senecas, who drove them off South of Ohio in 1650; but it was far more ancient; the trees showing that it had been left, soil formed and trees begun to grow towards 1475.

C. S. R.

29. Economy or Science of Wealth

The Divitial art is a new branch of this science, which teaches how to produce and increase wealth, by carefully husbanding and employing the Savings of Industry: whereby industry itself, with moral happiness, and social comforts are also promoted.

Among the many institutions to which this art has given rise, the Beneficial Societies and the Savings' Banks are the most conspicuous and useful; but some others less known are not less so, and there is room for several new ones on improved plans.

Having paid peculiar attention to this subject, written an analysis of this art, and found some new important principles of it: we propose to invite the public attention to it very speedily in a more impressive form; when we have visited the new institutions lately established in Baltimore; where these principles were first made known by us in 1825.

Meantime we merely state now, that the two fundamental principles which we claim to have discovered and published in 1825, are,

1. That every dollar and cent saved by industry, frugality and care, ought to be invested with the property of accumulating at simple or compound interest, *by conversion into Stocks!*

2. That every public or private Stock consisting of such Savings, ought to be divisible at pleasure into any required amount of dollars and cents. Whereby any Savings become convertible into productive Stocks, and any such Stocks convertible into fractions available as money or remittances.

It is evident that such ample and useful principles cannot fail to interest every body that can save a penny out of industrious earnings: nor fail to be applied every where, when more generally understood, as they have already partly been applied in Baltimore and Boston.

C. S. R.

30. ATLANTIC REVIEW.

Until this Journal assumes the Monthly form, it will be impossible to give comprehensive Reviews, and we must confine this department to short ecclectic notices. We are even inclined to curtail them; since we might sometimes offend irritable authors, who do not wish that the defects of their works should be exposed. But a veridic, enlightened and independent Review is very much needed, and we hope to be enabled to furnish one hereafter.

1. Cabinet of Natural History and American Rural Sports. Philad. 1831. 1v. 4to. with 24 colored figures of animals. Published by Mr. Doughty. A popular work issued in monthly numbers, with good figures and interesting accounts of quadrupeds, birds, &c.; but some bad names. The authors being chiefly anonymous, their wonderful tales and lucubrations can be of no authority in science.

2. The Alphabet of the Primitive language of Spain, and Philosophy of the Euscaran or Bask people. Extract from the work of Mr. De Erro, by G. W. Ewing. Boston, 1829, 1 thin 8vo. with the Bask alphabet. Very valuable philological work, proving the antiquity of the Euscaran language and alphabet, akin to the Etruscan and Greek; and giving the primitive philosophy of numbers. We shall again notice this work.

3. Manual of the Land Birds of the U. States and Canada, by Prof. Th. Nuttall, Boston 1832, thick 12mo. with many wood engravings. Very good compilation, useful like all manuals, with some original observations, and tolerable figures; but those of birds should be colored.

4. On the Causes, Cure, and Means of Preventing the Sick Head-ache, By Dr. James Mease, Philada. 1831, small 8vo. A useful small work, teaching what diet and changes of habits will cure this disease.

5. Geography and History of the Western States, By T. Flint, Cincinnatti, 1828. 2 vol. 8vo. A lively popular writer, but neither profound nor always accurate.

6. Sketch of Long Island, By Silas Wood, Brooklyn 1824, 1 vol. 8vo. Much addition to historical knowledge, and on the Indians of Long Island with a vocabulary.

7. Annals of Philadelphia and New-York, By Walton. Philada. 1830, thick 8vo. fig. Curious book on the first state of these cities and their gradual changes.

8. Collections of the Historical Society of Maine. Portland 1831. 8vo. Some addition to historical knowledge. The most interesting articles are a compendious history of Portland, with a map, by Willis, and an Essay on the Noridgwock or Penobscot language, a dialect of the Abenaquis, by Lincoln.

31. SCIENTIFIC NEWS.

1. Newman, a German traveller, has lately brought 10,000 Chinese manuscripts from China to Germany. What a treasure of new learning for Chinese scholars!

2. Mr. N. Dunn of Philadelphia, has brought home from China where he resided 11 years, a very extensive collection of implements, models of arts, dresses, natural objects, &c. He means to begin a Chinese Museum in Philadelphia, and make it a free Institution. A laudable example worthy of imitation.

3. In Austria, ruled by one of the most despotic governments, there are schools in every Village paid by the State, every child is compelled to learn reading, writing and numeration. By a late law no one can be married, nor received as a servant if he has not learnt this. Many of our States appear to be behind Austria in civilization and education, since they neither pay for it nor encourage it. No uneducated man ought to be a voter in this enlightened age and country.

4. Mr. Tanner is preparing a new edition of his large map of the United States, much improved, and above all, with many corrections and additions in physical geography and oreology. He has very liberally purchased the surveys of Hills and Mountains made by Prof. Rafinesque in many States, and the Northern or N. E. termination of the Alleghany will no longer be lacking in our maps. All the range of hills in Ohio and Kentucky will be added for the first time to our geography.

5. T. A. Conrad has issued 3 numbers of his Marine Atlantic Conchology, containing the genera Pecten, Lima, Solen, Solecurtus, Nucula, Sanguinolaria, Petricola, and Cardita, with colored figures of each sp. He is also engaged on a work on our fossil shells, which is speedily to be produced or begun.

T. Town, Printer, Back of 112 Walnut St.

ATLANTIC JOURNAL

AND

FRIEND OF KNOWLEDGE;

A CYCLOPEDIC JOURNAL AND REVIEW

OF UNIVERSAL SCIENCE AND KNOWLEDGE:

HISTORICAL, NATURAL, AND MEDICAL ARTS AND SCIENCES:

INDUSTRY, AGRICULTURE, EDUCATION AND EVERY KIND OF USEFUL INFORMATION:

EDITOR, C. S. RAFINESQUE,

Professor of Historical and Natural Sciences, and Member of several learned Societies in Paris, Brussells, Vienna, Naples, Bonn, New-York, Philadelphia, Cincinnati, Lexington, &c.

Knowledge is the mental food of man.

VOL. I. PHILAD. SEPTEMBER, 1832. [EXTRA OF No. 3.

NOTICE.

THE appearance of the Spasmodic Cholera in Philadelphia, having induced the Editor to lengthen his usual Summer Excursions, during July, August and September, the third number of this Journal (now printing) will only appear in the beginning of October, and is preceded by this Extra Number. The fourth Number shall appear in December. Both shall only be sent to those who have paid or sent the small subscription amount. This Extra Number is intended as a warning to those who have neglected this, and as another sample of the contents of this Journal, which will appear to deserve, as they have already partly received, the warm approbation of all the liberal friends of knowledge and science. Great difficulty having occurred with subscribers in forwarding the small amount of subscription, we recommend again to send us $ 2, in which case we are willing to bear the heavy postage; or else to join five together to send us $ 5 for five subscriptions in one place. 3dly, To send $1 by a friend coming to the city. 4thly, To pay it to the Postmaster, and request him to send it or inform us of it. 5thly, We give below a list of agents in some places to whom the money may be paid. 6thly, In case of need, the agents of Atkinson's Saturday Evening Post, and Casket, as well as of the Journal of Health, may be applied to, and the $ 1 paid them, informing our friend Atkinson of it, when they write to him and remitting the same.

In all those cases, whenever we shall hear of $ 1 being paid or secured, the Journal shall be sent, with the back numbers, to new subscribers as long as they can be furnished. Price $ 1 per annum on 4 numbers, or $2 for 12 numbers forming a volume of 400 pages and many figures.

CONTENTS FOR THIS YEAR.

THIS JOURNAL is dedicated to all the sciences and branches of knowledge; but chiefly all the historical, philosophical and natural sciences, on which it contains more new materials and details than any other Journal of a similar size, nay perhaps as many if not more than some dearer and bulkier. Above all it gives chiefly materials concerning America, and has nearly as many articles on Geology, as the American Journal of Geology.

In proof threof, it is sufficient to notice the principal subjects and essays contained in Nos. 1, & 2, or that will be found in Nos. 3, & 4.

General Knowledge. Latent knowledge. Taxes on Knowledge. Cheap Books. Employment of Wealth. Impediments to Knowledge. Primitive Discoveries, &c.

Education. Free Institutions of Paris. Principles of Fellenberg. Principles of Jacotot. Institutions needed in America, &c.

History. Of China before the flood. Early Colonies. Cradle of Mankind. Asiatic Negroes. Polynesians, &c.

American History. American Nations. Atlantic Nations. America before the flood. Primitive Negroes of America. History of Zapotecas. Domestic Animals. History of Shawanis. Laws of Lolloway. Ancient History of the Iroquois. Last Indians of Virginia and New-Jersey. The Americans are not Jews, &c.

American Antiquities. Letters to Champollion. Alphabets of Lybia and America. Antiquities of Tennessee. Of Ohio. Of West Kentucky. Of Missouri, &c.

Philology. American Languages. Origin of American Language. Philosophy of human Speech. English Homonyms and Synonyms. Letters to Klaproth. Vocabularies of Mandans, &c.

Meteorology. Climate of Genessee. Physical phenomena of the Cholera. Singular Meteors. New Theory of Tides, &c.

Geology. Caves of Kentucky. Strata of Ohio and Kentucky. Geol. letters to Bronguiart. Salses of Europe and America. Licks of Kentucky. Geology of Alleghany Mountains. Coal Mines of North America. Volcanic Theory. New Cave with fosil bones. On Oreology. Essential View of Geology. Feroe Ids. Coral Ids. Great Western Limestone basins. The Knobhills. Lakes of Ohio. On the American Oolites. Geology of West Maryland. Age of Mountains. On Crystallization. Origin of Sand and Sandstone. Geological regions of North America, &c.

American Oryctology. Vulgar names of fossils. Silicious fossils. On Geodites. On Cavulites and Antrosites. Genera of American Trilobites. Lamellites, N. G. Lucilites, N. G. Flexurites, N. G. Nevryctes, N. G. of Encrinite. Odocoileus, N. G. of fossil teeth. Fossils of Sherman Creek, 50 Sp. Fossils of Ohio and Kentucky. Fossil Trees and ferns, &c.

Mastology. New Jaguars and Couguars. Two new Moles. A new Otter. A new Shrew. Bats of North America. New Squirrels. New Field Mice of Kentucky, &c.

Ornithology. New American Eagle. Sea birds of Kentucky, &c.

Erpetology. Two Salamanders of Kentucky. Two New Lizards, of do. Two N. G. of Turtles. Several Snakes, &c.

Ichthiology. Supplement to the Fishes of Ohio. New Fishes of Lake Erie. Of the Rivers Susquehanna, Potomac, Delaware. Inland Fisheries of the U. S. &c. Ichthyological regions of N. America, &c.

Entomology. On 15 Mosquitoes or Culex of North America. On the Ants of do. &c.

General Zoology. Letters to Cuvier, &c.

Botany. Letters of Agardh and Torrey. 24 N. Sp. American plants. New Cherry Tree. New Dioneas. New plants of Bartram's Garden. New plants of Maryland. New plants of N. Am. from my herbarium. Subterranean plants. Botanical Letters to Decandolle, &c.

Agriculture and Horticulture. Plants giving Oils. Best shrubs for hedges. Sulfur in Trees. Double Crops. On the several kinds of Mulberry trees. Subterranean horticulture. Melissa or Balm, &c.

Mineralogy. Gold Mines of North America. Obsidian of Pennsylvania. Friable Lignites. Coal Mines, &c.

Astronomy. New Views on Solar Systems. On the Galaxy. Comets and Tychomes.

Mathematics. Principles of Sometry. Numerical numbers. Bulk of Bodies. Oblique Mensuration, &c.

Philosophy. Theory of the Mind and Will. Emanation of Beings. Analysis of Pythagorism.

Geography and Travellers. Highest Mountains of America. Ridges of the Alleghany. Ancient Geography of America. Ascent of Mount Etna. Falls of River Cumberland. Mineral Springs of the United States. The Imalaya Mountains. Douville Travels in Africa. Scientific Explorers of America, &c.

Health and Medicine. Chinese Maxims of Health. Physical phenomena of the Cholera. Tables of liability to Consumption. Salt in Hydrophobia. Remedies for Cancer. Consumption quite curable. Medical Botany of the U. States. Dangers of Burials, &c.

Industry and Economy. New Science of Wealth. Plan of a six per cent Saving's Bank. Principles of Economy. Trades lacking in the United States. Manufactures of the United States. Stereography and Pyrography. Duties of Mankind. Theory of Population. Sets of Performers, &c.

Atlantic Reviews. Short Analytical Reviews or Notices of about 60 late American Works.

Miscellany. Scientific News. American Drama. Fragments of Poetry, &c.

Scientific Travels of the Editor in 1832.

Our Excursions have been chiefly extended through West Maryland and Central Pennsylvania, applied to Geological, Botanical and Zoological researches performed at leasure, from June to September. We have visited Baltimore and found many rare objects in the Cabinets of Dr. Powell, Cohen, Hayden, &c. We have explored the Geology of Maryland from Baltimore to the Alleghany, and from the Potomac to Emitsburg. In Pennsylvania, chiefly in the mountains, from the Maryland line to Sherman Creek and the River Juniata, and from the mouth of Juniata to Westchester in a S. E. direction. On Sherman creek in Perry county, we have found a new and very rich locality for fossil remains, where in one week we collected about 50 different species, of which a further account will be given in No. 3. We have found new localities for Obsidian, Lignite, and other rare minerals. In Ichthyology we have observed and drawn 25 Sp. of fishes from the Susquehanna, and Potomac Rivers, with their affluents, chiefly new species. In Botany we have collected 1200 specimens, chiefly in the Aleghany ridges, and have perhaps 5 or 6 new species. We have visited the remarkable Cave of Carlisle, where fossil bones and teeth were once found, one of which we possess. We have also visited the Mineral Waters of Belinda, Maguire, Emitsburg, Carlisle, Kennedy, &c., of which we shall publish accounts, &c.

The Primitive Black Nations of America.

By Professor C. S. Rafinesque.

The Society of Geography having offered a reward for the best Memoir on the Origin of the Asiatic Negroes, I sent them last year two Memoirs; one on those Asiatic Negroes, wherein I demonstrated the affinities of their languages with the African and Polynesian Negroes, as well as with the Hindus and Chinese, and renders it probable that all the Negroes originated in the Southern Slopes of the Imalaya Mountains, as they did once exist all over India, South China, Japan, Persia, and Arabia. My second Memoir was on the Negroe or Black Nations, found in America before Columbus, wherein I proved their existence and connection by

language with the Negroes of Africa and Polynesia.

These Memoirs have been rewarded by the learned Society of Geography, with a gold medal of 100 francs, which was lately communicated to me by Messrs Warden, our former Consul in Paris, and Jomard member of the Institute.

This gratifying intelligence will be acceptable to all my friends, and furnish another proof of my ability to unravel at last, the origines of all the American Nations and Tribes, in pursuing the path which I have opened, by comparing all the languages mathematically and numerically with each other.

To many, this fact of old Black Nations in America will be new, yet it is an important feature of American History, as well as the existence of primitive White Nations there still more numerous. To furnish a kind of insight into this subject, I will here merely enumerate the Black tribes of which I have found evident traces and remains in North and South America.

1. The Ancient *Caracols* of Hayti, represented as a Nation of Beasts by the Historical Songs, see Roman and Martyr.

2. The *Califurnams* of the Carib Islands, called Black Caribs or Guanini by others, are a black branch of Caribs. See Rochefort, Herrera, &c.

3. The *Arguahos* of Cutara mentioned by Garcias in the West Indies, quite black.

4. The black *Aroras* of Raleigh, or *Yaruras* of the Spaniards, ugly black or brown Negroes, yet existing near the Oronoco, and language known, called Monkeys by their neighbours.

5. *Chaymas* of Guyana, brown Negroes like Hottentots, see Humboldt.

6. The *Mangipas* and *Porcigis* of Nienhof, the *Motayas* of Knivet, &c., all of Brazil, brown Negroes with curly hair. See also Vespucius and Pigafetta.

7. The *Nigritas* of Martyr in Darien, yet existing in Choco under the name of *Chuanas* or *Gaunas* or *Chinos*. See Mollien. Ugly black or red Negroes.

8. Those of Popayan called *Manahi*, blackish with negro features and hair. See Stevenson.

9. The *Guabas* and *Jaras* of Taguzgalpa near the Honduras. See Juaros, &c., now called Zambos.

10. The *Enslen* or *Esteros* of New California, ugly blackish Negroes. See Vanegas, Langsdorf, &c.

11. The Black Indians met by the Spaniards in Louisiana in 1543. See Soto's invasion.

12. The Moon-eyed Negroes, and Albinos, destroyed by the Cherokis, and seen in Panama. Barton, &c.

Among these the Yarura language has 50 per cent of analogy with the Gauna, 40 per cent with the Ashanty or Fanty of Guinea, and about 33 per cent with the Fulah, Bornu and Congo languages of Africa. In Asia it has 39 per cent of numerical affinity with the Samang Negroes, and 40 per cent with the Negroes of Andaman as well as those of Australia or New Holland.

All this and many other details are given at length, proved by authorities and compared Vocabularies, in my Memoir.

EMPLOYMENT OF WEALTH.

There are already in the United States, many individuals, who by personal industry, inheritance, or accumulation of property, and its increase in value, possess wealth beyond their wants.

Liberal generosity is for them a duty, as well as a judicious employment of their superfluous wealth or income. Great wealth, unless properly employed, is detrimental to the State, and possessors, becoming dangerous to public freedom, and the temporal or spiritual welfare of individuals.

It is said that Monarchies perish by poverty, but Republics by too much wealth in individual hands.

This truism will often render wealthy men obnoxious to their neighbours and fellow citizens, unless they are known to make a good use of it. When they do they become public benefactors.

Avarice and perpetual accumulation is a vice, useless prodigality is another: both extremes ought to be avoided. When childless, rich men ought to consider the poor or the public as their children. When they have a posterity or relatives to provide for, they must beware not to make them too rich and vicious, as wealth acquired by inheritance instead of personal exertions is often mis-spent or squandered. It is sufficient to provide a competence, a share ought always to be set aside for useful public purposes.

But instead of waiting till death comes to snatch our possessions, in order to give what cannot be held nor enjoyed any longer, how preferable it would be to do the good we intend while we are yet living: that we may see it and receive the blessings of those we may benefit. There is hardly any merit to leave by will what can no longer be our own after death. Wills besides, are sometimes lost or set aside, or not properly complied with; we can never be sure that our good intentions will be fulfilled. The best, safest and surest mode is to give while we live, that we may see and enjoy the beneficial effects of our charitable or patriotic purposes: whereby we enjoy the reward of good deeds by praise and esteem in this world, and their eternal heavenly reward beyond this life.

Some religious men try to buy heaven! either by wills or donations; but no bribe will take them there! God reads the heart. Good deeds alone are of any avail. What is given after death, not being our own then, is hardly a gift, but a mere legal disposition.

To pamper the church or sects is not a good deed. It is against the law of God that churches should be rich: it is besides detrimental to the state, and whenever they become too rich, it may happen that to despoil them or destroy them becomes a public duty. No perpetuity can therefore belong to religious donations. Yet to build free churches, religious schools and libraries are good deeds and commendable. But to endow them richly is wrong and pernicious. To help missions and societies for tracts, temperance, peace, &c. is worthy of praise; but must be blamed if such religious societies are made too rich; when something wrong will always happen, and the objects be often perverted.

True charity and benevolence consists in giving to the poor, the helpless, the aged, the cripple, the lame, the blind, the sick, the destitute, the ignorant, the oppressed, the unhappy—to relieve, help, feed, clothe, instruct, support, and comfort those who are in need of any thing. Not by giving mere trifles to beggars; but by providing all the free institutions of benevolence which are required in a crowded society and exuberant population.

The rich by monopolizing the soil and wealth of the land, assume the duty of supporting those who cannot acquire either. By having the means to do much good, it becomes their duty to do it. The best gifts are those which are of a permanent or perpetual nature, calculated to be useful not to one but to many, not for a day but for years or forever.

Although ostentation and pride may often mingle with public gifts as latent motives: yet charity throws her veil over motives and accepts the good intention. Patriotism does the same and never asks for motives. Ostentation is only baneful when it gives with a blind hand, to rich, useless, fashionable or extolled institutions or individuals, instead of poor, useful and meritorious ones.

Free institutions for all useful purposes of the actual improved civilization are needed all over the United States. They abound in Europe, even in the most despotic countries.

With us they are very scarce as yet; nay several kinds altogether lacking.

Even in Turkey among Mahomedans, it is deemed the duty of wealthy men to give a tithe or at least one-tenth of their income for useful purposes or good deeds: each being at liberty to apply it to whatever they deem best; and they are allowed to leave by will one-third of their whole property in this way, which becomes forever free of taxes, and not liable to confiscation; as they can appoint their own trustees they commonly appoint their own posterity as trustees forever, who are thus provided for. They thus build free colleges, churches, libraries, roads, bridges, acqueducts, fountains, baths, bazars or stores, caravansaries or hotels, hospitals, chapels, monuments, &c. all free institutions, besides periodical alms or distribution of food, &c.

Open your hearts and your hands you wealthy men of this fruitful land of freedom! Follow the example of the Turks, and of all the christians of Europe, who for a thousand years past have founded a multitude of free institutions of public benefit. Enquire into the wants of the needy and of society at large, and do the good you intend yourselves, and speedily. Life is short, time is swift. Build or found these institutions while you live and have health. See it done or appoint friends to the task if troublesome. And when it is done, rejoice in your hearts, and receive the thanks of thousands of your fellow men. Become public benefactors, let your names and good deeds be inscribed on stones, the tablets of history, and the memory of those you will benefit.

The free institutions wanted are chiefly the following.

Hospitals for the sick, the disabled and cripples.

Asylums for the blind, those with chronic diseases, for the poor orphans and widows, for children abandoned by parents, for reclaiming vicious persons, &c.

Free schools and colleges for the needy ignorant boys and girls.

Schools of industry, agriculture and mechanics like the Fellenberg schools: they support themselves.

Free colleges for all the arts, sciences and professions. Chairs and lectureships in colleges.

Free public libraries in every city and town.

Free museums of Natural History and Fine Arts in every city and town.

Free factories to give work and employment to all those who are willing to work and out of employ.

Institutions to lend money on pledges without interest, or at a small interest to the poor in all emergencies. These are found all over Europe and are called *Pious Banks.*

Free halls and stores, to lend for exhibition or deposits of works done, without fee or entrance money.

Botanical gardens and experimental farms for the improvement and free teaching of horticulture and agriculture.

Public baths either free or with a very small entrance fee, so as to enable the poor to enjoy this healthy luxury.

All these and many others to be as free as light, air and water, so as to be similar to divine gifts. Yet baths at six cents would be cheap enough for the purpose and pay the expence of attendance.

Pious Banks might charge five or six per cent to pay expences, or might lend without pledges to honest sober mechanics or industrious men to buy tools, materials, &c. or foster genius by lending on engravings, maps, books, &c. for a period.

May this be done, may some of our readers do it, may we live to see it. Heaven and earth will smile on such deeds.

BENJ. FRANKLIN, JUNR.

SAVINGS' BANKS AT BALTIMORE.

Having visited these institutions, as proposed and announced in No. 2. I have found that since 1825, and 26, when I made known there the true principles of improving these useful establishments, several new institutions have been established which are all become more or less Savings' Banks, allowing interest on deposits. Some have been chartered, some have not, and two are private banks managed by individuals. Such has been the utility of this system that nearly all the old banks enjoying a state monopoly have been compelled to adopt it also. Yet this has not prevented the common kind of Savings Banks from continuing its business in the usual way. All are thriving and giving good dividends.

These Banks have all agreed to give three per cent interest on casual deposits and account currents, four per cent on special deposits payable one month after demand and five per cent for those three months after demand. They also give certificates of those special demands, payable to order. They have therefore adopted all my views except the divisibility of the certificates.

A plan similar to that of Baltimore or still further improved, has long been contemplated and needed in Philadelphia; where there are many more savings of industry than in Baltimore. It is probable that a meeting of the friends of such an undertaking will soon be called, meantime a plan is here added of an improved Savings Institution, wherein it is contemplated to give six per cent interest for savings; as the poor ought to receive as much as the rich for their earnings. Our Savings Bank gives only four and a half per cent which is wrong, and in New-York only five, where the legal interest is seven. Therefore such improved institution must meet the approbation of all the industrious and liberal members of the community.

C. S. R.

Plan of an improved Savings Institution.

1. To be called the DIVITIAL INSTITUTION, or the SIX PER CENT SAVINGS INSTITUTION OF NORTH AMERICA.

2. Every individual may deposit any sum, at any time, and as often as wished.

3. The smallest sum received will be a dollar; on which interest will be given.

4. Every deposit must be for a specific time at the option of the depositor: which may be renewed for any other time at pleasure, or withdrawn with interest at the appointed time.

5. The depositor shall receive at his option a book where the sums will be entered, or certificates of deposits to order or bearer and divisible on demand.

6. Every depositor of $ 10 for five years in his own name, shall be a share holder and voter in future elections.

7. Six per cent shall be given on all deposits, and compound interest calculated after the first year.

8. To pay the expences of the Institution, one per cent shall be deducted from the interest on the first year, but nothing on any other year, and the odd days of the months never calculated for the interest.

9. If this fund and the profits of the Institution exceed the expences an extra dividend will be given yearly to those who have kept the deposits one year in the Institution.

10. The Institution shall be managed by a board of —— Trustees, elected by the subscribers at the first meeting in the first instance; and after one year by the share holders.

11. Each share holder shall be entitled to one vote only, whatever be the number of his shares, and he must vote personally or by letter. No proxies will be admitted.

12. The Trustees must all have deposited at least $ 20 in the Institution for five years, and give perso-

nal bonds for performing their duties.

13. They shall elect among themselves, a President, a Cashier, and a Book-keeper; who must give personal bonds for performing their duties.

14. The President shall preside at the Board of Trustees, and sign the certificates, books, &c.

15. The Cashiers shall receive and pay the moneys deposited or withdrawn and keep the securities.

16. The deposits shall be invested in public or private securities, mortgages, loans on stocks and goods; and every other safe business on the divitial plan.

17. No compensation shall be given to the Trustees the first year. It shall afterwards be decided by the share holders at the first election whether one dollar or more for every time they meet, being once a week, ought to be granted them.

18. The Trustees shall from time to time, according to the amount of business, fix the compensation to be paid to the President, Cashier, and book-keepers, or any other officers to be employed by the Institution.

19. The Institution shall be opened at first once a week; but as soon as convenient twice a week or every day if required, to receive and pay.

20. Business and investments by the Trustees shall be transacted only once a week, unless a special call of the Board, is called by the President.

21. The Trustees and Officers shall be liable personally for their transactions, and the stockholders may at any time meet to appoint a Board of Control, to oversee and rectify their transactions.

22. No charter of incorporatien for this Institution shall be asked, until it has been two years in successful operation, and it is demanded or assented to by three-fourths of all the stockholders.

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AND

FRIEND OF KNOWLEDGE;

A CYCLOPEDIC JOURNAL AND REVIEW

OF UNIVERSAL SCIENCE AND KNOWLEDGE:

HISTORICAL, NATURAL, AND MEDICAL ARTS AND SCIENCES:

INDUSTRY, AGRICULTURE, EDUCATION AND EVERY KIND OF USEFUL INFORMATION:

WITH NUMEROUS FIGURES.

EDITOR, C. S. RAFINESQUE,

Professor of Historical and Natural Sciences, &c.

VOL. I.] PHILADELPHIA, AUTUMN OF 1832. [No. 3.

Knowledge is the mental food of man.

1. ANALYSIS OF FELLENBERG'S SYSTEM OF EDUCATION.

This system is one of the greatest improvements on education effected by philanthropy during this age, since it enables *to educate the poor without any expense.* It is as well calculated for the United States as for Switzerland, yet it hardly begins to be appreciated and introduced. There must be a great lack of patriotism, liberality, and philanthropy in legislatures and individuals, if similar institutions are not quickly adopted every where. To contribute partly to this desirable object, we shall give a brief analysis of the practical principles of Fellenberg, furnished us by a pupil of his school.

1. The good and wise Fellenberg has acted upon the following principles.

2. The present society and generation are unhappy: we ought to endeavour to afford or give to posterity the means of being less so, by a better education.

3. A new kind of education is needed, not by levelling the two classes or poles of society, the rich and the poor; but by rendering both happier. They ought not to be mixed nor blended; but both prepared for their respective duties.

4. Education is the aim and instruction is one of the means to achieve this improvement. Education consists in forming the heart and character, unfolding the understanding, and giving strength and health to the body.

5. Instruction speaks only to the memory, but by exercising the understanding and reason, it has a due influence on the heart and education. A little instruction with much education is better than little education with much instruction. By neglecting education for instruction we have lost sight of this true aim.

6. Each class ought to be taught by counsel in action, exercise of hands, enlightening their understanding, and ennobling their hearts, that they may love and practice virtue.

7. The poor are directed to the labor of their hands, care is taken of their minds and hearts to lead them to a virtuous conduct; their future welfare and happiness, with an assured subsistence are secured by making them enlightened and virtuous husbandmen and mechanics.

8. The rich or superior classes are taught to love the poor or the inferior classes, so as to produce social happiness and harmony, and prevent civil discords.

9. The insensible but rapid changes produced by the progress of human mind, the subdivision of property, the abolition of feodal ties, the influence of discoveries, changes of manners, &c. absolutely require a modification of society and education in those who are to lead or rule.

10. Social peace can only be preserved by enlightening them and directing them well in their youth, so as to make them useful and popular leaders. Thus preventing revolutions, and the strife of ambitious hypocrites directing the rabble.

11. The worthy Fellenberg has given up his time and fortune for thirty years, to put in practice these improvements. He was once much opposed by the aristocracy of Berne in which Canton, his estate of Hofwyl is situated. But he has overcome all opposition and succeeded to make Switzerland the centre of European civilization.

12. This was done without any ultimate expense, nor diminishing his estate, since it was found that the schools supported themselves by the labor of the poor, and the pay of the rich.

13. The liberals applaud his labors, the servile tremble. Some monarchs have forbidden their subjects to send their children to it; yet it is always filled by the liberals and the Swiss.

14. It has been said that such improvements and knowledge made so cheap, may be abused. But Fellenberg has proved that their use may be regulated, and all the abuses repressed.

15. From 1809 to 1821, or during twelve years, the only expenses or advances were $3,600, or only $300 per annum: while many thousands have been educated at Hofwyl. Thus hardly one dollar expense for each student on an average.

16. The establishments of Hofwyl consist of eight schools or institutions. 1. Model Farm. 2. Experimental Farm. 3. Agricultural Factory. 4. School for Boys. 5. School for Girls. 6. Institute, or Superior School. 7. Agricultural School. 8. Normal School.

17. The model farm is cultivated with the greatest care, with the most perfect implements and machines, and with the least number of cattle. Whereby Fellenberg obtains more produce with less labor, and sets an example to all.

18. The experimental farm and garden is used to test every kind of new practices and improvements; whenever their utility has been proved, they are introduced in the model farm. This is a very beneficial school of improvement.

19. The third branch or manufacture of agricultural implements and machines is a most interesting and wonderful establishment. It receives models from all countries. Nothing is adopted or rejected without testing by experiments. It is a complete application of mechanics to all the branches of agriculture. It supplies new useful tools and machines to all Switzerland and Europe.

20. In the school for boys they are admitted from five to twenty. They support, feed and instruct themselves by their own labor in the farm and factory.

21. The instruction consists in practical agriculture, reading, writing, arithmetic, geometry, agronomic botany and natural history, abridged history, geography, drawing, modern languages, music, gymnastics, &c. It is found that the methods of natural sciences form the mind of youth to order better than languages; when riper mathematics are added.

22. If any child shows genius of extraordinary talents for any thing, he is taken to the superior school or institute, and thus every poor child has a chance to become a member of the superior class by his talents and exertions.

23. The monitorial plan is adopted for every thing; the monitors are selected from the best scholars, and may be superseded by others: thus keeping up the moral influence of a co-equal emulation.

24. The students are treated like the adopted children of their teachers. They are made happy in labor, meals, games and recreations. Thus a domestic and public education is happily blended. They have plenty

of exercise, a good healthy diet, and at eighteen or twenty they enter the world well prepared for every duty.

25. The teachers are selected with care; they partake of the labors, studies and recreations, they treat the boys mildly, all punishments are lenient and paternal, yet hardly ever inflicted.

26. The school for girls is separate, but similar. The poor girls are raised from the abjection of servants, taught to provide for themselves. They are employed in suitable female labor, taught taste and skill of hands.

27. The two sexes are not intended for the same occupations, women have less strength, but greater skill in all sedentary occupations. They are taught all what is required to become good wives and mothers, which has great influence on producing good husbands and good children.

28. The institute or superior school, is chiefly intended for the rich scholars who pay for their board and tuition; they have somewhat better accomodations, and are taught all the branches of science and literature as in colleges: but in other respects fare and behave as in the lower school.

29. In the special agricultural school are admitted men, all students are above twenty, chiefly land owners, who are taught the improved agriculture of the schools and farms and pay for it.

30. The last or normal school is held in summer, when forty lectures are given to students wishing to be teachers, to enable them to spread and apply this education to all the villages of Switzerland.

Let all those who wish for the welfare of mankind and our country, ponder well on this useful, benevolent, practical, and practicable plan, so as to introduce it speedily with us everywhere. Few modifications will be needed in the United States, we have in fact the two classes of rich and poor already, instead of nobles and poor. Ten years, from eight to eighteen, will educate a child without cost to the parent nor the state, and make him a useful enlightened citizen.

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2. Taxes on Knowledge.

One of the means employed by the foes of knowledge, freedom and civilization, to check these blessings, is to tax knowledge. It is done in many ways in different countries. The most depraved governments employ censure of the press, prohibitions, printers' license tax, stamps, heavy duties on paper and books, heavy postages, &c. in order to prevent the circulation of knowledge.

Even in England heavy complaints are made against stamps and taxes on knowledge, excessive duties, &c. While in the United States we appear to follow closely this example, although we boast of complete freedom of the press. This is a kind of political hypocrisy since it is not true. Without mentioning here the numerous impediments to the increase of knowledge, exceeding those of France and England in some instances, and which shall hereafter be enumerated, the actual needless taxes in knowledge will now command our attention, and be exposed.

The heavy postages on periodicals (not newspapers,) on pamphlets, books, printed circulars, engravings, orders, &c. is the most odious and obnoxious. Because quite useless, not required for revenue, nor to support the post office department. When pamphlets were at two cents per sheet, it was said that the mails were overloaded with them, and that the nation was in debt. The tax was triplicated and raised to six cents per sheet, with the acknowledged intention of preventing their circulation by mail, as the tax amounts to about two hundred per cent on their cost, or one hundred per cent on their usual selling price. This avowed shameful purpose of preventing the circulation of pamphlets and books, by giving a kind

of monopoly to periodicals, has compelled authors and publishers to issue almost all publications periodicaly so as to enjoy the benefit of the lessened postage, and thus the mails have been loaded with them as heretofore and even often with pamphlets and books, such being the need of the people.

Upon newspapers the tax amounts to about twenty-five per cent on the average for weekly papers.

On a paper of $ 2 per anuum, 52 numbers at 1 cent 52 cents, or 26 per cent. When sent far 2 cents $ 1.4 or 52 per cent!

On a daily paper of $ 8 per annum about 300 papers at 1 cent $ 3 or 37½ per cent, or 75 per cent when sent far!

On periodicals, monthly or quarterly, of about $ 5 per annum, and about 60 sheets at 1½ cent 90 cents or nearly 20 per cent, when sent far 2½ cents the sheet $ 1.50 or 37½ per cent!

Even these rates are extravagant and useless. This tax is not required by our treasury, which is now overflowing. It is not required by the people who loudly complain of it. It is a tax on industry and knowledge, the very reverse of the protective taxes on industry. Lastly it is not required by the post office department, because the tax on letters pays all expenses. It is said that half of it alone goes into the post office treasury, the other half being allowed to the postmasters as a compensation for the trouble of distribution. The half going to the post office is such a trifle as not to be wanted by it. If all postages on these were abolished there would be no lack of applicants for the office of postmasters every where, with the express condition of distributing periodicals gratis. Or if that would be too liberal, a small compensation of one cent for every periodical distributed, might be allowed to the postmasters alone, the United States or post office department charging nothing. There is already a precedent for this practice in the city letters, on which 1 cent is allowed to the postmaster alone on each letter large or small.

No more trouble is found to distribute a pamphlet or book, than a periodical pamphlet, and therefore one cent to postmasters on each would also be an adequate compensation. But with the actual abominable tax of 200 per cent on them, any modification would be acceptable, even one cent a sheet which would reduce the tax to one-sixth.

Now a pamphlet of 64 pages 8vo. or 4 sheets, pays 25 cents postage, or 150 per cent on first cost of about 10 cents, or 100 per cent on selling cost of 25 cents!!!

At this new rate they would pay 4 cents or 40 per cent on cost or 17 per cent on selling price.

A book of $ 2 and 25 sheets now pays $ 1.56 postage tax or 78 per cent; but on the prime cost of about 75 cents, it is above 200 per cent. While by the new rate it would be 16 per cent on selling price or 33 per cent on the prime cost.

If it is contended that the mails would be loaded with books and pamphlets at this rate, so much the better, since knowledge would circulate freely and rapidly. Pamphlets and periodicals could be carried by the mail in weekly wagons, at a cheap rate, instead of daily mail bags, by new and easy arrangements. At present a single book or pamphlet can hardly circulate. It must be sent with others in packages, at a great expense of time if not money.

The same facilities ought to be extended to every kind of printed materials sent by mail, as handbills, circulars, engravings, prints, music, &c. It is a shame to charge letter postage for any printing less than 2 sheets. They certainly cannot be heavier for the mail nor more troublesome to deliver. There is no excuse for this imposition and prohibition of knowledge. Handbills

must now be sent by private conveyance or not at all. Circulars are prohibited likewise except to the rich. There is no end to the inconveniences to which the public is liable by these illiberal and preposterous arrangements. A letter of half a sheet pays like a sheet, but half a printed sheet pays four times as much as a single printed sheet. Is it not unjust and abominable.

They have probably originated in want of information in the legislators on the subject, and above all in the fact that they being free of postage do not feel all the evils of this system. Let them be taxed too and they then would perhaps think of the people they tax, and who pay them to make good laws, neither useless nor vexatious.

Another abominable and useless tax is that on double letters, or rather inclosures of drafts or money, whereby the rich can afford to send his large remittances, and the poor, or whoever wants to send or receive small remittances, is prohibited by the following shameful taxes.

To send a draft or bill or $ 1 including the letter 25 per cent, if far 50 per cent!!!

To send $ 5, 5 or 10 per cent.

To send $ 10, only 2½ or 5 per cent.

To send $ 100, only ¼ or ½ per cent!!!

This falls heavy on all publishers of periodicals and many other trades. It is preposterous and intolerable, since there is no more trouble in the delivery of letters with inclosures. It ought to be remedied. All money sent by mail to be free or liable to a tax of one per cent only, one cent on one dollar, and one dollar on one hundred. This would be just at least. Or else the franking privilege to and fro of postmasters ought to be extended to editors and authors, or all the useful trades who deal and depend on small remittances.

These post office impositions, extortions and prohibitions have swelled this statement so far that the taxes on printers and booksellers must be omitted at present. Let us merely state the fact that there are heavy taxes, mostly useless and obnoxious on 1. Foreign books never printed here. 2. On lead and type metal. 3. On paper and machinery. 4. On wood cuts, copper plates, and lithographic stones. 5. On paper and pasteboard. 6. On skin and parchment, &c. all which fall on these useful trades and the manufacture of knowledge, journals and books. Besides the charges of taxation, advertising, publishing and selling.

B. Franklin, Jr.

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3. *Analysis of the Philosophy of Pythagoras as promulgated 2400 years ago.*

God is One: He is within the universe and the universe is within God.

God is every where and yet no where! He is a circle, the centre of which is every where and circumference no where.

God is the soul of the universe: the order and harmony through which it exists and is preserved.

God is the great Unit: numbers and things emanate from the unit.

God is universal, ineffable, perfect, and the principle of every good.

All what is, exists by number and harmony.

Harmony rules over numbers and produces order.

Harmony is the invisible sun of the world.

Beauty, good, virtue and health, proceed from harmony.

The science of numbers is holy: it is the only certain one.

The science of bodies is less certain; they are evanescent and ever changing.

Nature is a stream that ever flows.

Nature is what may be seen of God: it is the body of God.

God is the soul and life of nature.

The material part of nature is

formed by elements: these are the various configurations of its parts.

The souls are particles emanated from the universal soul.

They partake therefore of immortality: their annihilation is impossible.

Death is their passage from a body to another.

Space is infinite. Time is infinite. God is infinite.

Nature is incommensurable: the plurality of worlds is evident.

The smallest star is a sun similar to ours, shining over planets and worlds like ours.

We revolve round the sun; they revolve round their suns.

The sun, the stars, the moon, and the planets are globes. Our earth is also a globe.

All the worlds have inhabitants like or unlike those of our globe.

The souls travel from bodies to bodies, and from worlds to worlds.

This is the spiritual metempsychosis or passage; the real palingenesy or renovation and resurrection.

Every thing is passage and renovation in nature and man.

Such is the birth of man, his childhood and his education. Such will be his death.

Man will not be annihilated at this passage, nor die forever. He will have many lives yet to go through.

Rewards and punishments, await us in these after lives, according to our previous behaviour.

God is good: men are wicked. Why so?

Because God is perfect and men imperfect.

The imperfections of men create moral evils and disorders.

Philosophy and wisdom correct these evils and disorders.

Philosophy is not wisdom; but it leads to it, it is the love of good.

Science is not philosophy; but it leads to it. Science is the knowledge of order.

The philosopher acknowledges no other country but his family and mankind; he waits for the return of primitive equality, ere he may adopt another.

He tells the truth without fear, it is his duty.

He deplores and unveils the crimes of men and nations.

What will be his rewards? persecution, contempt or neglect.

If he is asked what God he worships, let him answer: a God whose body is light, and whose soul is Truth.

He believes when he has strong motives of credibility, and he obeys when he sees the need of it; but not otherwise.

Let him respect the law, when it is respectable.

There is an Eternal Law, anterior to all other laws, and their immortal type.

This law is the law of universal order and harmony.

Every man is tacitly bound to preserve this law, and to contribute to the preservation of moral order.

The rulers, priests, and warriors, who disturb this order, are as many banes of society.

The tyrants and slaves are the hammers and anvils of society. Let us beware to be crushed between them.

Wicked men labor under a mental disorder. Let us try to cure it. Wisdom is the remedy to be used.

Let us exercise universal benevolence. We must love all men even when they are wicked.

Let us correct the evils of human nature by education and instruction.

Happiness is offered to all men, let them reach it.

Do not deny this right to any one except to those madmen who seek their happiness in the misfortunes of others.

The regeneration of mankind, will never be completed until the insatiable demon of property is abolished.

But if we were to say to the wealthy, put your riches in common, they would call us knaves.

If we were to say so to the ignorant, they might call us fools. If to rulers and powerful men, they would forbid us to repeat it.

What is then to be done? Let us labor in silence and by our example. A time will come, when it will be safe to speak openly the truth.

Real equality will then be understood, and effectually established.

It consists in every individual being equally enlightened, wealthy and happy, according to his wish and capability.

Natural equality is not fit for the mob nor the ignorant; they could not enjoy it a single day without mischief.

But let us work to make them fit for it in time.

Our good and bad qualities proceed from our education.

Let us reform this essential branch of human economy.

The reform of mankind is a labor for ages, it will be subject to many relapses; but we must not despair to achieve it.

Let nothing disgust us and thwart us in this noble and eminent undertaking.

Those who feel a passion for the love of truth and wisdom will never sink under it.

Let us transmit the means and knowledge from age to age, from nations to nations.

Let us nurse with care in our bosoms, this last hope of mankind; and when its appointed time will come, let us present it to their eyes.

But let us beware to give guilty bearings to any eternal truths.

Meantime let us improve ourselves and increase our wisdom and knowledge.

Let us beware of our senses, they often deceive us.

Our secret senses are our internal sight and feeling.

We must not judge of things by mere appearances, nothing is more deceitful.

Let us study their essential and real qualities and faculties.

There is often no better ground for an opinion than plausibility.

If a thing is possible, it may be believed. To believe we must begin by doubting. Doubt is the mantle of wisdom.

The nature of bodies results from the mixture and separation of elements.

The elements emanate from God.

The sun is the mirror of God.

The light of God shines on our minds as the light of the sun on our eyes.

It delights to brighten a good mind.

Ignorance is the night of the mind; errors are its clouds.

Happiness is the general pursuit of mankind.

Harmony is the universal chain of happiness.

Let us imitate on earth, the harmony of the heavens.

The same order ought to rule over men and societies, as over worlds and things.

Let wisdom unite itself to labor, and genius to strength, as the earth is united to the skies.

Nature is a republic. It is indivisible, imperishable; all the members thereof act in eternal harmony.

Nations! you are all the children of nature; imitate your mother.

Men! in all your thoughts and actions, think of God.

When we wish to become wise, we must not be satisfied with what is good, but ever strive to reach what is better still.

This is the complement of wisdom. Let us improve forever.

But the past has been for us a mixture of good and evil.

Such will be futurity. Never fear evil, but conquer it.

If we expect every thing, nothing shall surprise us.

When danger shall threaten us, let us warn them by the brazen shield of wisdom.

If the promulgation of truth becomes dangerous, let us conceal it in our bosoms and those of our fellow friends.

Let us institute a society for the preservation of this sacred fire.

Let us become the vestals of truth, let us preserve this holy deposit pure and unadulterated.

It is deplorable to conceal truth and happiness from mankind; but it is often needful.

When the time will come for unveiling the sun of eternal light it will be our duty to do it.

Let us select with care the vestals of truth: every one is not worthy to nurse it.

Our bonds shall be union and harmony, order and knowledge; the results wisdom and love, health and wealth, happiness and peace.

We must unite the labor of the hands to the labor of the mind.

We shall receive no salary for admission, nor instruction, nor under any other shape; let us beware of venality; must we pay to see the sun?

But no one among us can hold perpetual property; he may give it to whom he pleases.

We shall live in common with our families: our eldest men shall be our rulers: our wisest men our teachers and advisers.

Our motto shall be, *To do Good and Keep the Truth.*

Let us be physicians of the body and the soul.

Let us instruct, admonish, and judge mankind.

Let us seek to become mediators in domestic discords, and even in public ones if we are able and called upon.

Let us guide youth, inexperience, ignorance, and repentance.

And let us perform all this without reward.

Let us pardon, ever before hand, those who may do us some injuries, as we pardon the staff of the blind-man striking at random.

Let us remember that we must not say all to all.

Let us beware of blood, money, and error.

Let us live and let us die, for truth, justice, equality, benevolence and happiness.

BENJ. FRANKLIN, JUNR.

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4. THE AMERICAN NATIONS AND TRIBES ARE NOT JEWS.

As early as 1829, I published in the Evening Post a letter to the Rev. Ethan Smith, against the singular but absurd opinion that the American tribes descend from the Hebrews or the ten lost tribes. This opinion based upon some religious prejudices and slight acquaintance with philology and antiquities, has been entertained by Penn, Adair, Boudinot, and several other superficial writers, among which Ira Hill, author of a late work, *Antiquities of America Explained.* Hagerstown, Maryland, 1831. It is to me astonishing how in this enlightened age, any such unfounded belief can be sustained; if greater absurdities still did not prevail as yet among a few.

Two recent instances of egregious folly based upon this singular tenet, have induced me to republish my letter of 1829, which if read by those laboring under this delusion cannot fail to shake their belief.

A new Religion or sect has been founded upon this belief! the Mormonites, thus called after a new Alcoran, or Book of Mormon, (which is not a Jewish name.) Supposed to be written in gold letters more than 2000 years ago by Mormon leader of the American Jews. This Book which no one has seen nor read but the founder of the sect, the probable writer thereof, has been made the Bible of a new sect. I have tried in vain to procure a copy of the translation, wherein I could certainly detect a crowd of absurdities and incongruities. Meantime a Sect of Fanatics has arisen therefrom, and wandered from New-York to Ohio and Missouri: an evident proof how false beliefs can be

spread and made subservient to crafty purposes.

The second instance is that of Lord Kingsborough, who having adopted the delusive idea of the Mexicans and other American nations being Jews, has vainly spent the vast sum of 30,000 pounds sterling, or $135,000!!! to publish fac similies of Mexican Antiquities and Manuscripts in the Libraries of Dresden, Paris, Vienna, Berlin, Rome, and Bologna, executed by Aglio, and with notes of his own in support of the Jewish origin of the Mexicans. This Work in 7 volumes folio, sells for 200 pounds sterling, or $900 and is deemed a wasteful employment of money, even by the learned, because it does not contain the translations which would be more useful than the glyphic texts. It lacks also the Mexican Manuscripts preserved in Madrid and Simanca's archives of the Indies; the only valuable novelty in this huge work are the Mexican monuments, drawn by Depaix, with the history of Mexico, by Sahagun a Spanish monk, who spent 30 years in Mexico in the 16th century. The great sum spent by this nobleman for this vain support of his fallacious jewish theory, would have been sufficient to unfold the true history of all the nations of America, by their monuments, languages, traditions and books, or publish 100 volumes on the subject. C. S. R.

To the Rev. Ethan Smith,
Pastor of Poultney in Vermont.

Rev. Sir:

I have lately met by chance the second edition of your work on the *Hebrews in America*, and read it with attention, as I do all works on our Indians, while writing their history before and after Columbus.

Your work and Boudinot's Star in the West, have widely spread again among the religious readers, the old, obsolete and I may say absurd notion that our Indians, nay all the various American tribes and nations descend from the ten tribes of Israel. This theory advanced by some Jews, by William Penn & Adair, who knew but few tribes of our Indians, is now laughed at by all the learned and enquirers on American history. As it is a pity that the religious community should be again deluded into such improbable belief, I mean to try to show you the impossibility of the fact, and request that should you publish a third edition of your work you will add my remarks, and answer if you can my cogent arguments.

I shall first state why their origin is impossible and next confute your boasted proofs of it.

The American nations cannot descend from the ten tribes of Israel; because,

1st. These ten tribes are not lost, as long supposed, their descendants more or less mixt with the natives, are yet found in Media, Iran, Turan, Cabulistan, Hindostan and China, where late travellers have traced them, calling themselves by various names.

2d. The American nations knew not the Sabath, or Sabatical weeks and years. This knowledge could never have been lost by Hebrews. The only weeks known in America, were of three days, five days, and half lunations, as among the primitive nations, before the week of seven days was used in Asia, and based upon the seven planets, long before the laws of Moses.

3. The Indians hardly knew the use of iron; although common among the Hebrews, and likely never to be lost: nor did they know the plough.

4. The same applies to the art of writing, such an art is never lost, when once known.

5. Circumcision was unknown and even abhorred by the Americans, except two nations who used it, the Mayans of Yucatan who worshipped one hundred idols and the Calchaquis of Chaco who worshipped the sun and stars, believing that depart-

ed souls became stars. These beliefs are quite different from Judaism, and besides this rite was common to Egypt, Ethiopia, Edom, Colchis, &c.

6. None of the American tribes have the striking sharp Jewish features, and physical conformation.

7. The Americans eat hogs, hares, fish, and all the forbidden animals of Moses; but each tribe abstain from their tutelar animals, or badges of families of some peculiar sort, as we abstain from the dog and horse without any rational cause.

8. The American customs of scalping, torturing prisoners, canibalism, calumet, painting bodies, and going naked even in very cold climates, are totally unlike the Hebrew customs.

9. A multitude of languages exist in America, which may perhaps be reduced to twenty-five radical languages and two thousand dialects and sub-dialects. But they are often unlike the Hebrew in roots, words and grammar: they have by far more analogies with the Sanscrit, Celtic, Bask, Pelagian, Berber, Lybian, Egyptian, Persian, Turan, &c. or in fact all the primitive languages of mankind.

10. The Americans cannot have sprung from a single nation, because independently of the languages, their features and complexions are as various as in Africa and Asia.—We find in America; white, tawny, brown, yellow, olive, copper, and even black nations as in Africa. Also dwarfs and giants, handsome and ugly features, flat and aquiline noses, thick and thin lips, &c.

Let us now examine your proofs.

1. You say all the Americans had the same god, *Yohewah:* this is utterly false. This was the god of the Chactas and Floridans. I have found a multitude of names for it among the Unitarians. Many had triple gods or trimurtis as in Hindostan and with names nearly Sanscrit. Polytheism, idolatry and a complex mythology prevailed among all the most civilized nations. All the ancient religions were found in America, Theism, Sabeism, Magism, Hinduism, Shamanism, Fetichism, &c. but no Judaism!

2. The few examples you give of affinities with the Hebrew language, belong only to the Floridan and Caraib languages. I could show you ten times as many in the Aruac, Guarani, &c. but what is that, compared with the 100.000 affinities with the primitive languages.

3. All the civilized American had a priesthood or priestly caste, and so had the Hindus, Egyptians, Persians, Celts, Ethiopians! were they all Jews?

4. Tribes are found among all the ancient nations, Arabs, Berbers, Celts, Negroes, &c. who are not Jews. The most civilized nations had castes instead of tribes in America as well as Egypt and India: the Mexicans, Mayans, Muhizcas, Peruvians, &c. had no tribes. The animals badges of tribes are found among Negroes and Tartars as well as our Indians.

5. Arks of covenant and cities of refuge are not peculiar to the Jews; many Asiatic nations had them, also the Egyptians, and nine-tenths of our American tribes have none at all, or have only holy bags, somewhat like Talismans or Fetiches.

6. The religious cry of *Aleluyah* is not Jewish, but primitive, and found among the Hindus, Arabs, Greeks, Saxons, Celts, Lybians, &c. under the modification of *hulili, yululu, luluyah*, &c. other Americans called it *ululaez, gualulu, aluyuh*, &c.

7. The mentioned traditions of our Indians or rather the Algonquin stock only, point to a N. W. origine; but the Natchez, Apalachians, Talascas, Mexicans, Mayans, Muhizcas, Haytians, &c. have traditions to have come from the East or through the Atlantic Ocean. It is important to distinguish the American nations of Eastern origine from the later invaders from Tartary: they are as

different as the Romans and Vandals.

8. All the alledged customs common to Jews and Americans, are positively of primitive origine and found also among nearly all the ancient nations of Asia, Africa, Europe and Polynesia, nay even among the wild negros to this day; are they then all Jews! The actual Puritans and Sabatarians who keep the Jewish Sabath and bear Jewish names, would be greater Jews by far, if customs alone were to settle this question.

You will therefore perceive that this old notion of yours is totally impossible and at variance with all our knowledge of the Americans, when we study all the Nations, instead of taking as you do the Algonquin or Lenapian although a widely spread family for your rule and main example of all.

I hope you will consider again the question with impartiality, divesting it of your mystical problems, and studying the writers on South America with more care. You will find that Garcia a Spanish writer, had 200 years ago, in his origin of the Indians proved that they may have come from many ancient Nations, even before the flood, and Dr. M' Culloh of Baltimore, has proved the same thing in his researches on America. C. S. Rafinesque.

Phadelphia August 1829.

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5. The Cradle of Mankind or the Imalaya Mountains.

The learned had long disputed on the locality and habitation of the primitive progenitors of mankind. Those who believed in a single cradle as Eden sought for it in various parts of Asia.—Others believing through pride or ignorance in many such cradles found them almost every where or in all the continents. Both were wrong; late uncontrovertible discoveries and proofs have proved that the cradle of mankind was unique and in the central mountains of Asia. The best biblists assent now to this evident historical fact, see Wells, Russell, &c. as well as all the philosophers who are not blinded by their systems.

Bishop Heber has said that the Imalaya mountains were the centre, the cradle, the throne, and the altar of the earth. Therefore they were the cradle of mankind, from whence the various nations have spread like divergent rays throughout the surrounding lands and islands.

The mountains and tablelands of Central Asia, deserve therefore the utmost attention from us in every point of view, either religious, or historical, or geographical. Yet we do not know them completely: the Southern slopes and sides with the centre alone have been lately explored, while the Eastern, Northern and Western sides have hardly been penetrated. However we know enough already to warrant our conclusions, and travellers are now attempting their further exploration. Those who have already visited and described these interesting mountains are chiefly Polo, Gruber, Goez, Webb, Moorcroft, Turner, Frazer, Herbert, Gerard, Jaqueminot, Buchanan, Kirkpatrick, &c.

Many names have been given to these central lofty regions of Asia, that furnish important references.

Ima-laya the actual Hindu name means Snowy or Icy mountains. The *Muz tag* of the Tartars has the same meaning; 2000 years ago the Greeks called them also *Imaus*.

This name is chiefly given to the Southern range which the Chinese also call *Sien-shan* or snow mountains. But every range and side has peculiar names. Three principal ranges appear to run from E. to W. of which the Imalaya or Southern is the longest since it is connected with the mountains of Persia and Caucasus to the West, and those of China in the East.

The others are the *Lung-shan* (Dragon Mts) or the *Tien-shan* (Celestial Mts) of the Chinese, and the Altay of the Tartars the most Nor-

thern. Each having tablelands between them.

The Central or Celestial Mts called also *Kuen-lun* in China appear to become in the West the *Belutag* or cloudy mts of Tartars, the *Pameru* or polar father of the Hindus, the Paropamisus of the Greeks, or *Bel-ur* lord of light.

The Altay or Alatay or Atalay spreads through Siberia and Tartary; with various names, the Chinese call it Kinshan or gold mts. The range called celestial in almost all languages is the most stupendous and interesting. It is the *Kilman* of the Tartars, *Tangra* of Thibet, *Meru* or pole of the earth of Hindus, *Muztag* of the Turks, &c.

But the collective name of these lofty regions was very anciently designated by appellations—the roots of which were TAL, TOL, TUL, meaning tall, high, lofty or eminent (lands, regions or mountains,) as it does yet in many languages, the English Chinese and Arabic for instance. Such were TOLO, T'HALA, TALAHA, TULAN, &c. in the old Sanscrit and primitive languages of Asia. Whence came the Asiatic ATLAS and also the ATLANTES of the Greeks, who spreading thro' the world 'Westerly, gave these names to many other places and nations.

Some of these ancient and modern names will be mentioned as examples.

Talaha ancient name of Tulan or Turan or West Tartary by the Hindus, who dwelt there before the Turks.

Tolotes, Scolotes, the ancient Scythians and Turks.

Talash Kingdom conquered by Oguzkan 2850 years before C. now Tala in Turkestan, *Tali* the ancient kingdom of Pegu, *Talao* of Laos, *Telinga* of South India, &c.

Tola-nor and *Tola-pira* the lake and river of Tola in the country of the Kalkas. *Tollen* their capital.

Talish, name yet of East Caucasus. *Athulas* since called Assyrians or Asuras.

Baran-tola is Central Tola, name of Thibet, this last name comes from *Theba* refuge, or *Tib* a peak. *Patala* was the capital of it, and *Tolo, Tulon, Tuling,* &c. cities in it. *Rutala* is the thibet or heaven of the Cingalese.

Tulan is a province of Gurwhal and *Tul* of Bukharia.

Thala or *Tawala, Dwala,* is the highest southern peak of Imalya.

Matala or *Mantulahy* or *Mansovar* is the sacred lake of Thibet.

The 7 earthly worlds, or continents of the Hindus are often called *Tolo* or *Tala* with various appellations, whence Tholos and Thule of the Greeks, and Tellus of the Latins.

Out of Asia these names abound also, since the *Talas* or Atlantes occupied or conquered Europe and Africa, nay, went to America in very early times. The Hindus say that *Atalas* king of *Tulya* conquered Africa. The Greeks mention many kings or a dynasty of Atlas or Telamon in Africa and elsewhere.

The Atlantes are also called Titans, Uranians, Ammonians, Thracians, Scythians, &c. by the ancient Greeks and poets. See Diodorus and Bryant.

In Greece they became *Atalantes, Talautians* of Epirus, *Aetolians* of Western Greece, *Thalacas* or Thracians of the East.

They gave name to Italy, *Aitala* meaning *land eminent,* or *Vetulia* from the capital of the *Hetulas* since called Hetrurians, Etruscans, Toscans and Rasens; and their capital Vetula and Vetulonia. *Atelum* was the capital of the Oscans. The Tuli, Rutuli, Cutuli, Antuli, Latins, &c. were also tribes of Old Italians, perhaps come from the *Cuntalas* an old nation of West Imalaya or the *Vetulas* a nation of Demons there.

In Spain they became the *Bastulas,* (*Low-talas,*) *Talasen* or Sons of Talas, mixing as in Italy with

the Oscans or Baskans or Eskaras, since Cantabrians.

In Europe a multitude of cities, rivers and districts bear their names from Toledo in Spain to Tula in Russia.

Northern Africa is filled with their remembrance and posterity. The Western mts called Atlas by the Greeks, were formerly called *Adtala* or first highland, now Adla and Tedla. *Hanteta* (whence Anteus) *Adala*, Altara, Atys, &c. were parts of it. *Tella* are yet the mts of Algiers. Ptolemy calls the central mts of Africa *Thalas*, and the Eastern are *Tagla*. Those of Fezzan are the *Gantela*.

Besides the true Atlantes of Africa which were said to have come from the Caucasus, we find there the *Autololes*, *Thalas*, *Taladas*, or *Daradas*, (now *Torvdos*,) *Getulians*, *Teladusi*, &c. all tribes of Atlantes; besides the *Atarantes*, called also Hamantes and Garamantes. Many cities bear their names, one of the oldest is *Talata* in the Messalata hills of Lybia near Tripoli where is a huge mound or altar 340 feet high now Zetiten.

These African and Spanish Atlantes gave their name to the Atlantic Ocean and to the great Atlantis or America! called in the Hindu books *Atala* or *Tala-tolo* the fourth world where dwelt giants or powerful men.

America is also filled with their names and deeds from Mexico and Carolina to Peru. The *Tol-tecas* people of Tol, and Aztlan, *Otolum* near Palenque, many towns of *Tula* and *Tolu*. The *Talas* of Michuacan, the *Matalans*, *Atalans*, *Tulukis*, &c. of North America, &c.

Thus all the Western Nations trace their cradle to the East and Central Asia: while the Chinese trace it there also, as well as the Hindus of the South and the Tartars of the North.

Besides these traditional proofs, two others concur to prove this fact. 1. The height of these mountains. 2. The origine of nearly all the domestic animals and cultivated plants and fruits being traced there, where they are found wild to this day, and hardly any where else.

The Imalaya mts as far as known are the highest on earth, although the Andes of America reach very near to the same height; but these are volcanic, thus unfit for a very early life population & civilization: while the Imalaya are primitive and fruitful. The highest mts must of course have been the first to appear above the waters of the ocean; they were not then covered with eternal snow as now, being low above the waves. Their table lands are the loftiest and largest on earth; thus likely to be the first habitation of men and animals.

The African Atlas has been deemed by Jackson in 1820 to be higher than Imalaya, because it is seen 245 miles off, in latitude 32, which he estimates to indicate a height of 29610 feet; and the Mountains of Elala in Suz lat. 30 seen at 240 miles to be 28980 feet above the sea. But other travellers lessen one half or one third this huge height, stating it to be from 14500 to 18000 feet: we have however no correct mensuration of it, and it may probably be found nearer than supposed to the Imalaya height. Like the Andes of South America; Chimborazo 21425 feet high was thought their highest peak, but lately Sorata has been found to be 25250.

Although the different travellers who have measured the peaks of Imalaya differ somewhat, yet they all agree within a trifle, and in stating that the valleys, plains and table lands between them support vegetation and cultivation at a higher level than any other country.

Dhawala or Tawala (Hoary) is said to be the highest properly measured, it is in lat. 19. Webb found it 27550 feet, while others reduce it to less than 27000. But Chumelari has been estimated at 30,000 feet. While the Celestial Mountains and Muz-

tag are believed to exceed 32000 feet, although they have not yet been reached nor measured. But they are seen at the distance of nearly 300 miles.

The limits of perpetual snow in lat. 32 is not at 11000 feet as systematic calculation would have it, but at 13500 feet. Frazer found vegetation as far as 13192 feet, Mosses and Lichens as far as 14700 feet. Against all rules the Northern side or slope of Imalaya is warmer than the Southern, owing to dryness and latent heat. Gerard and Jaqueminot found in Thibet cultivation as far as 17000 feet, and perpetual snow only at 20500 feet! Therefore the climate and soil improves inland in these lofty regions, and were still milder once when the peaks had no perpetual snow.

Thibet lies between the Imalaya and Celestial Mountains, Tartary between these and the Golden Mountains or Altay. Both are lofty plains and table lands from 10000 to 15000 feet above the sea, fertile and populous, except in the sandy desert of Cobi.

North of Cashmir the Imalaya Mountains take the name of Vindhyan, West of the Indus they become the Hinducush meaning Dark Mountains, with peaks 20500 feet high. Three ranges of ridges form the Imalaya proper, with peaks from 21000 to 28000 feet high. The third ridge is not penetrated by the rivers, the Indus and Ganges penetrate the two others.

The Geology of these Mountains is very interesting. As you ascend them four ranges of secondary hills and mountains are found on their Southern slopes. The first from 500 to 750 feet above the plains of India is of Sandstone, clay and gravel. The second is of Claystone from 1500 to 5000 feet high. The third are mountains of Limestone 7000 feet high. And the fourth of slate 8000 feet high. See Frazer.

Beyond begin the three primitive ranges of Imalaya, which are *however all stratified* even to the highest peaks. The strata are commonly inclined 40 to 45 deg. but often perpendicular, and some jumbled in all kinds of direction and forms, so as to *resemble marble paper!* They are commonly of Quartz, (black or white) Hornstone, Granite, Gneis, and Micaslate. Gangotri is entirely granitic, Jumnotri has veins of all colors. See Frazer.

No Volcanoes are found in Imalaya, except lake and water volcanoes; Tirtaputi in Ladak is a hot spring like a volcanoe spouting sediments half a mile in circuit. Some burning volcanoes in the Altay have not yet been visited. No diluvium is found on the mountains and peaks of Imalaya, except in some valleys, where many eruptions and disruptions of lakes have taken place. They have fossil remains in the secondary strata; but hardly any diluvial fossils. It is therefore doubtful whether the geological floods reached that lofty land, and probable it was the THEBA of the Bible or refuge in Noah's flood.

Imalaya and its branches E. and W. are the true native country of the Wild Ox, Horse, Ass, Goat, Sheep, Hog, Dog, Cat, Camel, Hen, Duck, Pheasant, &c, and almost every other animal that has since been domesticated, except those peculiar to America: the Yak or Thibet Cow is peculiar to it, and has not yet been spread very far.

All our fruit trees, all our cereal plants, and nearly all our culinary plants are also found growing wild in those mountains. It was long a problem whence came our Wheat, Barley, Maize, Rice, &c.; but they have lately been found there by travellers. They all say that there, is found the climate with the productions of Europe. They enumerate among the wild trees and fruits, the Apples, Pears, Grapes, Plumbs, Peaches, Apricots, Raspberries, Strawberries, Currants, Chesnuts, Walnuts, Mulberries, Gooseberries, Almonds, Cherries, &c. &c. also,

the Roses, Oaks, Pines, Larch, Cedar, Heath, Birch, Fir, &c. While among the useful plants the following are both wild or cultivated in various parts, Wheat, Barley, Rye, Rice, Mayze, Cotton, Pease, Beans, Lentils, Millet, Gourds, Melons, Carrots, Turnips, Cabbage, Onions, Fennel, Egg plant, Madder, Clover, &c., &c.

These animals, fruits and plants, which have accompanied mankind in his migrations, afford a strong proof that man first knew them there, which was their common cradle, and where began pastoral and agricultural life.

Many other proofs could be adduced to support this truth: since civilization, religions, governments, astronomy, the arts and sciences, nay every thing valued or employed by men can be traced also by us Easterly to those mountains, or those of Iran and Turan on their West slope near Persia and Turkestan; Cashmir and Balk being there two of the earliest seats of civilization. There also points the Grecian and Hindus Mythologies, Chinese History, and every primitive tradition; nay every language of the earth can be traced to that central cradle.

C. S. Rafinesque.

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6. OREOLOGY.

Relative Age of Mountains.

Although it is impossible in Geology to ascertain the exact age of Mountains, Strata, and Fossils, yet it is possible in many cases to detect their relative age or successive formations.

Beaumont who has lately paid peculiar attention to Mountains, thinks that he has found their relative age, and divides them into six ages or series.

1. Oldest, the undisturbed Sedimental Mountains, such as those of Saxony, Pilat and Cotedor in France, &c.

2. Second age, Mountains in parallel ridges, such as the Alleghany, Carpathian, Apennines, Pyrenees, Ghauts of India, also the Mountains of Persia, Dalmatia, &c.

3. Third age, Circular Mountains with concentric Ridges, such as the Western Alps, Mountains of Norway, Brazil, &c.

4. Fourth age, Mountains in divergent groups, such as the Central Alps, the Balkan, Caucasus, Himalaya and Atlas of Africa, &c.

5. Fifth age, the Andes of America.

6. Sixth age, Volcanic Mountains, the newest.

This System, like so many others in Geology, is based on observations chiefly made in Europe, and the opinion that Mountains have broken the primitive concentric Strata of the earth by rising from below by crystalization or intumescence. Is it not erroneous to suppose that the primitive Imalaya and Caucasus are less ancient than the Secondary Alleghany & Apennines? they appear quite as much disposed in ridges. All Mountains except the Volcanic may be considered as huge Crystals; their distinction in four series, Sedimental, Parallel, Concentric and Divergent, appears correct; but this disposition in crystalization may have been contemporaneous, and does not afford the best clue to their relative age. Perhaps the Tabular Mountains raised on Table lands, like the Imalaya and Andes, are the oldest.

C. S. R.

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8. Geological Survey of the Alleghany Mountains of Pennsylvania, in 1818, *from West to East.*

By Professor C. S. Rafinesque.

It is well known that the Alleghany Mountains run in parallel ridges from North to South, therefore in crossing them from East to West or from West to East, their structure, and the component strata of the successive ridges are easily ascertained.

I have crossed or penetrated those Mountains in 20 places from New-

York to Virginia; between 1804 and 1832; but in November 1818, returning from the Western States when vegetation was nearly gone, I attended particularly to their geology, crossing them on foot to collect specimens for my friend Z. Collins.

The result will be given in the form of a Journal, as written on the spot at the time,

11th November 1818. From Pittsburg to a tavern 24 miles E. country rolling. Sandstone perfectly flat, supporting in many places Bitumite and Slate: many Coal mines opened on the sides of the hills; some fossil remains in the strata.

12th. To Whitestone tavern 18 miles. Near Greensburg 32 miles from Pittsburg, the Sandstone strata cease to be perfectly horizontal, and begin to dip a little to the W. or rise to the E.

13th. To Laughlin 15 miles. At Youngstown 48 miles from Pittsburg, begin the Alleghany Mountains, the first range is called Chesnut Ridge, they are not high, only 500 to 600 feet. First ridge one mile broad to the Loyalhanah Valley, running through the hills. Strata of Sandstone very thick, slightly dipping W. Huge cubical Sandstone rocks on the sides and bottom of the valley, disrupted from the strata. Iron ores and mines in the hills. Coal in many parts, on Coalpit run, &c. Near Laughlin at the foot of the Laurel Hills, conical knobs or round hills with horizontal strata, Coal and Iron.

14th. To Quenehan Creek 10 m. The Laurel Hills are the second ridge of the Alleghany, beginning 57 miles from Pittsburg. Higher than the Chesnut Hills, about 800 to 1000 feet. Their structure is very different. They are seven miles across, forming a narrow table land on the top, which is of bluish Limestone in vertical strata! with some mixture of white Sandstone, so friable as to crumble into white sand, and some Shistose Slate in confined layers; but on each side of the hills or mountains, the usual coarse Sandstone is found, which dips W. on the West side, and E. on the East side, so as to become nearly connivent on the top.

15th. To the top of Alleghany 17 miles. Passed several small hills and ridges. Rase hill is the principal, partly slaty nearly horizontal. Beginning of the Glades or Stony unwooded places.

The third ridge of the Alleghany is the main, the highest and broadest, being called the Backbone Mountain, and dividing the waters falling into the Ohio and Atlantic. It begins 74 miles from Pittsburg, Stoystown and Stony Creek are at its W. foot. It is about 2000 ft. high; 12 miles across, forming a flat table land eight miles wide here, and further north much wider, as I am told, although the maps makes it a simple ridge. The Western Slope is very much inclined, the Eastern more abrupt and higher. It is altogether of coarse Sandstone, and Grit, with strata flat on the top, but appearing to dip W. slightly on each side. Some white friable Sandstone on top, forming Sandy tracts with Pines. Coal is found in many places, chiefly on the E. Spurs.

16th. To Bedford 17 miles. In the Eastern Valley or Waters of Juniata, beginning of the Slaty Region. The Slate is Silicious, dipping W. from the Alleghany to Schellsburg, E. of it becoming flat and covering the Sandstone. Coal is found in some parts of the Juniata Valley and near Yellow Creek.

Between Schellsburg and Bedford the hills are very interesting. Tull hill is composed of vertical Slate strata, running either from E. to W. or from N. to S. Long hill and Wills Mountain run transversely or from E. to W. Bedford near the Juniata, has many important localities around. The Mammoth Swamp, where Mammoth bones were found, the Mineral Springs, much resorted, with Limestone hills near them, strata dipping S. E. with many fossils.

17th. To Licking Creek 25 miles. East of Bedford are two narrow Water Gaps in the fourth ridge of the Alleghany, called the Tortoise or Terrase Mountain, through which the Juniata has broken and flows. The first is Denning's Gap. The strata are of Sandstone, dipping S. W. with many huge Limestone boulders unrolled but carried by the Debacle. The second Gap or Turtle Gap, is of Vertical Sandstone, with Limestone resting on it, or to each side in inclined strata; while between the two gaps five miles distant, the whole is Slate or Schist, nearly vertical, and running from N. E. to S. W.

Along the Juniata and in the valley beyond, the whole country is of Sandstone beneath and Slate above it, in various directions, either dipping West, or undulating, or nearly vertical.

Next comes Sideling hill, the fifth Ridge of the Alleghany, 104 miles from Pittsburg and five miles broad. This has quite a regular connivent or undulating strata of the same, dipping W. on the West Side, and E. on the East Slope. East of Sideling hill, the strata are undulating like the small hills. On Licking Creek there are Licks like those of Kentucky, with Clay.

18th. To Chambersburg 26 miles. Before the Cove Valley, are two small ridges called Great and Little Scrub ridges, chiefly slaty and undulating. The fine Cove Valley has a limestone and alluvial bottom very fertile. East of it, 127 miles from Pittsburg is the Cove Mountain, a Southern branch of the Tuscarora Mountain, and the sixth Ridge of the Alleghany on this road. It is about 1200 feet high and five miles across by the winding road, although narrow at the top. The whole coarse Sandstone in thick strata, slightly dipping, or undulating over it.

Between the Cove Mountain and the South Mountains to the E. is the Big or Long Valley, here 23 miles wide, which extends from Virginia to the Hudson. The West side of it is Slaty, the centre Limestone, and the East side Quartzose, where begins the Primitive Region. These three formations extend more or less through the valley, but are always parallel. Here the Schist or Slate extends nearly to Chambersburg. It is foliated, and nearly vertical, when dipping the small dip is E.

19th. To top of South Mountains 12 miles. Limestone nearly all the way in the valley, about nine miles wide. It is a blue or white Limestone chiefly, with veins of Marble, Lias and white Spar, with a great dip to E. but often nearly vertical or undulating; the outside is nodulose and smooth as if water worn. Many sinks in it as usual in Limestone Regions, some dry, some receiving streams that sink in it, some changed into large Springs. They are evidently Volcanic Springs, or the ancient craters of the limy outlets. No fossils seen in it.

At the foot of the South Mountains begins the primitive by a coarse quartzose rock, with Debris and Boulders of primitive rocks. These Mountains are here low, not above 500 feet high, but seven or eight miles broad, with rounded hills. The whole has a granitic nucleus as seen elsewhere; but here none is found in place. It is covered with a coarse Quartzose rock resembling Sandstone, and the whole track has many diluvial Debris and Boulders of Granite, Quartz, Limestone and a curious Pudding Stone, blue with white oblong spots. Iron is found in many places. Some boulders are rolled or worn, others are not. These Mountains improperly called South Mountains, are the Mattawan Mountains of the Indians, and the highest primitive ridge bordering the Atlantic primitive formations extending E. to the Schuylkill river at Philadelphia, in wide plains with low hills. The whole breadth of the Alleghanies near lat. 40, is therefore about 115 miles.

20th. To Gettysburg 12 miles.

Leaving the South Mountains, they are seen to run S. and bend to the N. W. The formation is the Flinty Shale, red or blue in strata nearly vertical, or dipping 60 to 80 deg. to W. and therefore not parallel with the Mountains. Some scattered small conical hills through the plains, of Granit or Gneiss, like the Mountains.

Here I terminate this Survey, as it will intersect at Gettysburg with the survey made this year from S. to N. from the Potomac to the mouth of the Juniata. In going E. to the Susquehannah I noticed however the Pigeon hills, South of Oxford and York, which are of conglomerate and singular formation.

I must conclude with some general remarks.

Although only six or seven ridges are found in the Alleghany on this main road to Pittsburg in S. Pennsylvania, their number varies in other places, as many ridges are much shorter than these main ones. In a N. W. Direction from Lancaster and Harrisburg to Lake Erie, 24 ridges at least are crossed, and the Backbone is a wide table land.

All these ridges appear somewhat like as many immense elongated crystals of the Globe, if we adopt the opinion that Crystalization has formed them: or as many long currents of submarine emanations and deposits, if we adopt the eruptive theory. It is very singular that I met but few fossils on this road and exploration. This proves that they are scarce, only found in some peculiar localities and basins, not every where as in the Ohio region of flat strata. Perhaps these Mountains belong to the primordial order or a very ancient age, rather to the transition than the secondary.

Boulders and water worn stones are also very scarce on them, only found in some valleys, never on the slopes and tops, except in the primitive South Mountains. Extraneous stones are found there but not in the Alleghanies. Yet fragments of rocks, cubical or angular, large and small, are not rare, being disrupted from the nearest rocks by convulsions, earthquakes, avalanches, storms and frost.

The various directions and undulations of the strata, preclude the idea of a regular and quiet intumescence. They rather appear to be the natural result of the foliated stratum of the rocky layers. Either sandy or slaty. The Sandstones have thicker layers and a disposition to cubical fractures. They are of all sorts and colors, intermingled within a small space or widely separated, from the coarsest gravel stone, even with pebbles in it to the finest quartzose granular Sandstone, the particles of which are angular and cristalized, and to the Gritstone and Freestone nearly homogenous or with particles of Mica. In colors I found them white, grey, red, rusty, and yellow, in various hues. The same with the Slates, which however lack the white color and have instead the black. Their tendency is to thin layers and foliated fracture. They vary in hardness, some being flinty, and others softer, with more alumine.

The soil of the Aleghanies appears to partake of the stones supporting it, being formed by their decomposition, with a mixture of alluvion carried by rains. The clay and marl formations are not common nor extensive. They as well as the licks may be traced to limited formations, rather than wide diluvial agency. Iron and chert are sometimes imbedded in the Sandstone. Some valleys are very fertile having a deep alluvial soil; but the ridges are commonly barren, with denuded rocks, although wooded and the leaves of trees have added to the scanty soil.

Although in Pennsylvania the highest ridges and tops of these mountains do not exceed 2000 or 3000 feet, they become much higher in the N. and S. at their extremities to the N. E. called Catskill Mountains, and to the S. W. In North Carolina, Tennessee, &c., called

Apalachian Mountains, both reaching 4500 feet or more.

ODOCOILEUS SPELEUS.

8. *Description of some of the fossil teeth found in a Cave in Pennsylvania. By C. S. Rafinesque.*

Among several curious fossils of the cabinet of Mr. Hayden in Baltimore, some teeth found in a Cave attracted my peculiar attention. Mr. Hayden had the goodness to present them to me: he stated that they had been found in the big cave of Carlisle, in Pennsylvania, by Mr. Wardel, who had broken them from a jawbone sticking out of the lime rock, and in fact one of the teeth is united to its socket and the fragment of a jaw.

This statement induced me to visit this locality, and new cave with fossils remains, which I did last August, in hope of finding more bones or teeth in it. A wonderful description of this cave published several years ago in the port-folio, made me expect something extraordinary; but I was as usual disappointed, since all these wonderful accounts are exaggerated. I found however the cave interesting enough in other respects; it is situated in the Big Valley, between the South and North Mountains, about one mile North of Carlisle on the banks of the Conocochig Creek, at the end of the limestone region and the verge of a slaty formation, being the main outlet of a Cavernose hill, with many holes, sinks and craters of eruptive formation as in Kentucky. But the rock is a kind of blue lias or compact limestone with thick inclined strata and no fossils in them. The cave however is incrusted with stalagmites and a limy crust of recent formation, in which the teeth must have been found partly imbedded. In my exploration of this cave I could not find any more teeth nor bones. The account in the port-folio states that bones were found at first at the bottom of the cave, which were mistaken for bones of Indians and scattered or lost: it is very probable that they were fossil diluvial bones.

I shall give hereafter a view and plan of this cave. The floor of it is not diluvial but Stalagmital and formed since the flood, but it may overlay a diluvial bottom, and it might be worthwhile to dig in it for fossils, as they have done in similar caves of Europe.

Meantime I have carefully examined and compared the teeth in my possession, and I cannot refer them to any living animal. Mr. Hayden thought they belonged to an extinct animal akin to the Hog. It may be so; but hogs have not hollow teeth. Therefore I have called them *Odocoileus* meaning *teeth well hollowed*, and I give the exact figures of them of natural size, that Oryctologists may further compare them and reduce them to their proper family: which is perhaps near to the tribe of goats or dwarfish oxen.

Odocoileus. Generic characters of the teeth. Grinders trilobate before three large ribs and two broad furrows between, middle rib or lobe longest and largest: convex and unlobed behind. Centre with a deep lunulated hollow with a Semipartition on one side.—*Remarks*, the enamel covers the whole teeth, even the hollow inside, the brim has a suture throughout evincing a tendency to a double laminar structure. The roots have no enamel, they have 2 or 3 unequal conical prongs with a visible hole at the end. Resembling by the ribs some Oxen teeth but size of a goat.

Odocoileus Speleus or cave Odocoil. Specific characters.—Size of

the animal like a large goat, teeth short & thick of a white color, swelled behind. *Remarks.*—The roots are as long as the teeth, and about half inch long. Part of the jaw fulvous, smooth outside with a wide transversal depression, cellular inside cells unequal. All in fine preservation.

The geological locality of these teeth indicates that they were brought there either by the animal itself or by diluvial agency (or an early overflowing of the creek close by), but since covered and partly incrusted by the recent limy exudation or crust of the floor and sides. They are by no means coeval with the old limestone strata.

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9. *Remarks on the Monthly Journal of Geology and Natural Science of G. W. Featherstonaugh, for May* 1832, (*but only published in July.*)

We regret to be compelled to notice the article in that *Stereotyped Journal*, which under the garb of a Review of two of our labors, is from beginning to end a jumble of scurility and a public attempt to injure us. —This article is a disgrace to the writer, and the Journal where it is found, as we verily believe nothing half so spiteful and disgraceful was ever before Stereotyped here or any where else.

It would be beneath the dignity of Science to imitate the example thus given us. Our purpose, which is merely to defend ourselves from a wanton and unjust attack, will be fully attained by a simple exposition of facts connected with that Journal, the editor of it and his sleeping partner Dr. Harlan. The public shall easily discriminate between the plain truth, and their farrago of envy and spite.

In April 1831, Dr. Harlan, who was then my friend, and whom I esteemed as a cultivator of some branches of Zoology, introduced me to Mr. Featherstonaugh at his own request, while lecturing here on English Geology. I was invited to attend his lectures, but went to very few, when I found that he had nothing new to present to the public, and was a mere echo of the local English Geologists, of whom we have so many works, that lectures are useless to teach their doctrines.

Soon after, Mr. F. undertook to publish a Journal of Geology, and offered me through Dr. H. to become a collaborator, stating that he would give a compensation for every page written for his Journal: to which I assented, although afterwards he changed his mind and pretended he could not afford any pay to writers. One of the objects of this Journal was stated to be by Dr. H., to oppose or expose the blunders of Prof. Silliman's Journal of Science, and of Prof. Eaton. I could not then receive any satisfactory explanation of this hostility of Mr. F. against them, but I have since learned in the North, that it is owing to Prof. Silliman having refused to puff Mr. F. and admit into the American Journal, his lucubrations on English Geology, already so well known, as he had nothing to offer on American Geology. Respecting Prof. Eaton, who has long been a friend of mine, (and whom I esteem, although he belongs to the old schools), I learnt from himself that Mr. F. was his bitter Foe, ever since something had occurred at Albany to defeat his application to be employed by the State for a new Geological Survey, because Prof. Eaton had already made one.

Many of my Geological and other Essays, having been seen by Mr. F. he highly approved of them at first, particularly my Geology of Kentucky, with drawings, and selected them for his Journal. But afterwards, when he found them clashing with his own English System, he did not publish them, and I had some difficulty to get them again. Out of six Essays put in his hands he has

only published one, my Visit to Big-bone Lick.

I was often urged by Dr. Harlan, who was the agent for Mr. F. to give him my remarks and criticisms on some of Silliman's and Eaton's minerals, &c. but I delayed to do it, although I could have no partiality for the first, who has allowed Mr. Barnes to publish my Ohio Shells, over again in his pages, and otherwise neglected my labors. I was loath to become an ally in the avowed hostility against those respectable professors.

In October 1831, I published my N. G. *Trinectes*, on which nothing was said by Dr. H. till March 1832. It was in my enumeration of some objects of my cabinet, containing not less than 117 new objects in eight pages, while Mr. F. has about eight in 117 pages of his Journal. Out of these 117 only six are criticised in May 1832.

In March 1832, I published the first number of my Atlantic Journal, which I had announced in March 1831 one year previous, before I was acquainted with Mr. F. and which my disappointment in his editorial management did not induce me to relinquish. This journal was not intended to clash with his; but as Geology and Natural Science were included in my plan: it appears that this gave great offence to both editor and partner, which added to a latent jealousy or envy of my labors, induced both to break with me, and write me very unbecoming letters.

The letter of Dr. Harlan inserted in this absurd review is dated only a few days after, and evinces his hostility by two false statements 1. He pretends that I never saw the bones of the Aulaxodon or Megalonyx, till in his possession. This is not only false but preposterous, *since I had them for several years under my care*, while Curator of Mr. Clifford's Museum after his death, when removed to Transylvania University; but I had seen all the fossils of Clifford's Museum, since 1818. As to labels many were erroneous, as they are yet, on the shelves of Clifford's Museum now in the Academy of Natural Sciences of Philadelphia, where some European fossils are mixed with American, to feed future geological blunders, and my beautiful N. G. *Trianisites* of 1818, is called *Tyranites!* When Dr. H. showed me again the bones, my memory was not bent upon that subject, yet I told him that I had called them *Aulaxodon*, from the sulcate teeth: but not published them yet as doubtful. Thus Dr. H. has published first these fossil remains as a new Megaonyx, and I gave him credit for it. While he has not done the same when he published my *Necturus* under a new name, as well as other animals, which I overlooked on the score of his personal friendship. It is not true that I have abolished the G. Megalonyx of Jefferson, which is a different animal.

2dly. As to the fish called by me *Trinectes* in Oct. 1831, it is true that the first specimen was given me by Dr. H. who could make nothing of it, and called it a Flounder; but he gave me the specimen to *describe, name, figure and keep*, I had then a right to send it to Cuvier, which I did to have his opinion on the striking want of anterior fins, making it a N. G. I quoted the true discoverer M. Carr, who at my request caught another for me, which Dr. Harlan took out of my hands in the presence of Mr. Carr, when I showed him distinctly the want of apodal fins forming a distinct N. G. from *Achirus*. Three other fishes unknown, to Dr. H., were lent me to describe, but returned afterwards as requested, with the names given them. So much for Dr. H's veracity.

Concerning the double review of Mr. F. the first relates to my enumeration or rather only to the six first objects in it. I am accused of imposture, puerility and lack of Geological knowledge; but the reviewer has mistaken his own faults and deficiencies for mine!

1. My G. *Mazama* is not new, it was published in 1817, and contains all the American Deer with simple horns. Many Sp. are living in Mexico and South America. To which living Sp. my silicified horn belongs could not be ascertained, therefore I called it protem *M. Salinaria.* Living Genera when found fossilized are certainly of the last geological age. This horn was shown to Dr. H. who said I was right in Sept. 1831 and to Mr. F. who could make nothing of it! yet I am accused of publishing without showing to such learned men!

2. The *Panallodon* was based upon teeth not silicified, but similar to the freshest bones found in the earth, nay, perhaps buried by the Indians, therefore later than N. 1. This was shown to Dr. H. who could not make out the G.

3. I have substituted the name of *Taurus* (Bull) to the absurd generic name of Bos, (Ox) ever since 1814, (See Princ. Somiol.) as I never could believe it right to call animals by neutral names. If Mr. F. and Dr. H. think otherwise they may call themselves *Eunuchus Sapiens!* instead of *Homo Sapiens!* This tooth is twice as big as a Buffaloe's recent tooth. It was shown to Dr. H. who pronounced it new, as unknown to him.

As to the bone called *Nephrosteon*, I acknowledge that it may be the Epiphysis of a whale, as Dr. H. did tell me in 1831, after my pamphlet was published. But it is perhaps a new whale, since he could not find it in Cuvier's (ossemens fossiles). *Nephrosteon* is however a very good name, and may become specific. Let the learned Mr. F. explain how a whale came inland in Louisiana, if not before the flood, when he blundered about diluvial.

Nothing being said of the 112 other new objects of this enumeration, animals, shells, fossils, &c. of my Cabinet, probably because the reviewers could not go beyond bones: this lessens my trouble of explanations.

The purpose of my pamphlet was merely to announce some objects for sale, and orders already received from England and France have evinced that this trifle had answered its purpose of making known my Cabinet, and collections of sixteen years arduous travels.

Thus much about bones of contention! and this comes from the two individuals who have had the effrontery to describe, name, figure, and make casts of a Sandstone Concretion for a Jawbone of a Rhinoceros, and impose it on the public as a discovery! the only one the sapient Mr. F. can boast of. Some also accuse Dr. H. notwithstanding his anatomical skill to have made a N. G. Osteopera, out of a decayed beaver skull, beaten by the tides! My fossil teeth and bones are at least bonafide such and not impositions.

The second part of this strange review, is on a par with the first. It purposes to attack the first number of the Atlantic Journal, and spends its venom upon the advertisements on the cover, (which are no more a part of it, than in the Mirror of New-York). One of which has been given at length, and then stereotyped, for which we ought to be duly thankful. The public knew long ago that I was a Pulmist ever since 1827, when I began that profession with eminent success. Nay Dr. H. and Mr. F. knew it very well and never found it amiss till I published the Atlantic Journal, and my advertisements have been seen before in 50 papers. Surely I have as much right to be a Pulmist, nay perhaps the first and only one in America, as Dr. Harlan to be a Dentist!

The contents of the Atlantic Journal have not excited pity and indignation in any one except the hearts of the reviewers. They stigmatize the whole without entering into details. What credit is due to their assertions will be best conceived by stating that they dare to say, that our No. 1, contains nothing new in

Zoology, while we have in it several new varieties of Jaguars and Cougars, 15 new animals in Cuvier's letter, a new Salamander, since acknowledged as very distinct from his *S. longicauda*, by Prof. Green, &c. My new views of geology are called ignorance; but theirs is darkness compared to mine, witness the *Rhinoceroides!*

My historical and philological discoveries are called insane! Thus was Champollion insane when he restored the Egyptian Antiquities as I do the American. The Geographical Society of Paris must have been insane to reward my Memoirs on American and Asiatic Negroes. Cuvier was insane when he dared to make out a Genus out of a single bone like myself, but Mr. F. is not insane in calling a rolled stone a jaw-bone, and making a genus of it!

I well remember that when I came to America, in 1802, Linneus was here as in England, the *nec plus ultra* of Zoology and Botany, while I who already belonged to the French school founded by Jussieu, Desfontaines, Ventenat, Lamark, Cuvier, Patrin, &c. and in my youthful ardor spoke of the treasures of new plants, animals and fossils which I saw, of new genera, and the natural families; I was deemed a rash youth and innovator by Barton, Muhlenberg, Mitchell, &c. I have lived to see my youthful rashness become science, and the new school adopted in England and America, after 30 or 40 years delays and struggles. I may live yet to see my mature insanity of improving every branch of knowledge, become wisdom, in spite of the obsolete doctrines and presumptuous conceit of such reviewers as Mr. F. and Dr. H. The French Methodic Schools of Geology, Philology, &c. will soon prevail every where as they have already, in Chemistry, Zoology and Botany; when the stale doctrines of Mr. F. and other snails in science, will be forgotten or set aside, like those of the 17th century; while mine, with those of other pioneers and precursors of Knowledge will become the leading doctrines of this age.

But I have perhaps, bestowed too many lines on such a tissue of absurdities and false statements as this shameful rhapsody contains. It will recoil upon itself, and bring discredit upon the Journal of Geology, as the Editor has shown himself neither liberal nor competent.

If Mr. F. has been successful as a lecturer, and in other things, he has failed as an editor, a man of general science, and even as a Geologist. He has disgusted many persons by his proud and overbearing sufficiency. He has been the first to assail in myself, one of the most peaceful members of society, and a devoted friend of Science and Knowledge for 30 years past, a Veteran in Science as he once called me. As he is neither a Zoologist, nor a Botanist, nor a Philologist, nor an Antiquarian, although too proud to acknowledge it, he cannot understand my labors and rails at them, like ignorant men so often do at learning, or whatever is above their comprehension.

The whole drift of his rhapsody is to injure me in the opinion of some distant readers, compel me to cry mercy as intimated, and cry in vain! But my labors are known and will be known where those of Mr. Featherstonaugh, (or Feather—Stone as he is properly called in New England, since all his Stones and Bones are mere Feathers,) never were, never will be, nor ever can be, since he has made no discoveries! while I count mine by thousands, having been the pioneer of discoveries in many natural and historical sciences in North America and South Europe from 1798 to 1832, having travelled 20,000 miles, always collecting or drawing. My illustrations of 30 years travels, with 2000 figures will soon begin to be published, and be superior to those of my friend Audubon, in extent and variety, if not equal in beauty. I shall study and

write as long as I live, in spite of all such mean attempts against my reputation and exertions, trusting in the justice of liberal men. Such for instance, as the reviewer of Lea's shells in the same Journal of Geology, for June; whoever he is, I am thankful to him for having properly noticed my labors on some shells which Lea had neglected or named over again. The wonder is, how this learned and candid review got alongside of the other, to which it is a perfect contrast.

C. S. Rafinesque.

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10. On the false Rhinoceroides of Featherstonaugh and Harlan.

To dispel errors and to evince truth is the duty of every genuine natural enquirer.

In the first No. of the Journal of Geology for July, 1831, the leading article is the description of a presumed jaw-bone, of which a new G. is made and figured, being called *Rhinoceroides Alleghaniensis*. This is the only fossil described by the editor, and was not even found by him.

When this jaw-bone was exhibited to a large class, as a great geological discovery of the Lecturer, nay, the only one he could boast of; I did not venture to contradict the assertion, supported as it was by the authority of Dr. Harlan, whatever were my doubts; but I merely ventured to state that if it was a fossil cast of grit-stone, it was a great anomaly, and to insinuate that whereas there was no proof of the animal having had a nasal horn like the rhinoceros, the name intended, did not well apply, and ought to be changed into *Tropodon*, meaning teeth like a keel. This suggestion was not well received nor attended to.

In my visit to Baltimore, in June last, after Mr. F. had proved hostile to me, I ascertained, in conversation with my old friend Mr. Hayden, one of the first Dentists and Geologists of our country, that this jaw-bone had been exhibited to him, and his opinion asked; when he candidly stated to Mr. F. that it could not be a fossil remain, because the apparent sutures were not in the proper places nor directions, and the teeth had no traces of roots nor sockets, besides other osteological reasons of less moment.

This was before his publication, and he had the benefit of this previous advice, which he neglected; choosing rather to believe Dr. Harlan, who concurred with him in opinion, to deem it a fossil, and thus make out a grand discovery. I have since heard that other Geologists in New-York, were of the same belief as Mr. Hayden, and laughed at Mr. F.'s pretended discovery, and jaw-bone of Grit.

In fact, the anomalous nature of the specimen, and its obscure geological site, ought to have corroborated this doubt. It is sufficient to refer to Mr. F.'s own description to perceive it. He says,

"The anomalous character of this fossil, made me hesitate to publish it. The mineral composition of the fragment is very anomalous. There is nothing of the nature of bone about it, except the form. The whole substance, the two teeth included, being an aggregate of small quartzose particles or Grit. It was found in a soil either alluvial or diluvial. It is of a doubtful but ancient age," &c. &c.

Thus this jaw-bone is nothing more than an adventitious fragment of Stone, with the singular peculiarity of two projections like teeth on it: which Dr. Harlan made out to be like a Rhinoceros'!

If Mr. F. had travelled in the Alleghany mts. he would have known that such singular fragments are not uncommon, and he would have picked up, many petrified hams or legs of mutton, or monkeys' heads, or snakes, &c., as well as rhinoceros' without horns!

If he had studied our mountain grits and sandstones, he could have seen that all the fossils and casts or moulds in it, are of the oldest marine

generation of Beings. Marine plants, Fucites, Torebratulites, and other shells, &c. Therefore that no bones, nor any terrestrial animal, much less quadrupeds can be found there, nor their bones decay in it, form moulds and rocky casts washed away by diluvion or alluvion!

Therefore, this *Rhinoceroides* is a non entity! a blunder in doctrine and fact, worse than the petrified rattle snake of Silliman's Journal, so much ridiculed by both the authors of this egregious geological and oryctological error. A mere casual concretion of indurated sand, or broken rolled fragment of sandstone grit! a lusus natura like Mr. F.

The blunder is great, it is not surprizing in Mr. F. who never yet knew our fossils; but it is shameful for Dr. Harlan, who is otherwise a clever Anatomist. It would prove that Mr. F. with all his pretensions, is only a pseudo Geologist and no Oryctologist at all. Since he has gratified Prof. Buckland and others with new casts out of his pseudo cast, and if he has succeeded to deceive them, we venture to suggest to him a manufacture of such fossil casts; we shall if he wishes, send Stone Cutters to carve them by hundreds for him in the Alleghany Mountains, and furnish him very cheap all kinds of Sandstone Bones, and Jawbones of Camels, Girafes, Whales, Lions, Mammoths, Monkeys, and even Men! with 100 N. Genera to grace his Journal when resumed.

Perhaps he was served in that way with the Rhinoceroides, & this would be charity to him: it would prove him as credulous as Dr. Mitchell, or Silliman, or Eaton, and ignorant of Oryctology; but would clear him of intentional imposition on the public, if the warnings of Mr. Hayden and others did not rather operate against him.

C. S. R.

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11. *Coal Mines of Nantico in the Alleghany Mountains. By Dr. Powell.*

Dr. W. B. Powell, of Baltimore, who is a very intelligent Geologist, although of the Wernerian school, has furnished us some facts respecting the Coal Mines of Pennsylvania; which he deems of Chemical formation in concave basins, and by no means of Vegetable origin. As he proposes to publish in Silliman's Journal these results of his long researches, we shall merely give here one of the facts communicated by him.

At the Nantico Falls of the Susquehannah, near Wilkesbarre, Luzerne county, the following are the succession of formations, where Coal Mines are formed in a kind of concave Basin, well displayed at the falls.

First formation, thin soil, newest of course.

Second, Slate, five to eight feet thick, newest stone.

Third, Millstone Grit, ten feet in the middle, thicker on the sides of the basin.

Fourth, Second Slate ten feet in the middle, becoming gradually 100 feet on the sides.

Fifth, First Anthracite Coal, 15 feet thick.

Sixth, Third Slate, 15 feet, 30 on the sides.

Seventh, Second Anthracite Coal, seven feet thick.

Eighth, Milstone Grit, with conglomerate, 125 feet thick.

Ninth, Bluish Sandstone with particles of Mica in it, 100 feet thick.

Tenth, Red Sandstone, 125 feet thick in the middle, less on the sides.

Eleventh and last formation reached. White Grawacke, very thick; and forming also a basin or concave support to the whole.

This Coal Basin therefore, has been penetrated or can be traced about 450 feet in the centre, and above 600 on the sides; it affords a fine illustration of the stratifications connected with Coal in the Alleghanies; but other localities display different successions.

12. *Geology of the Feroe Islands.*

In the description of those islands by Landt, is found a complete confirmation of the Volcanic theory of Basalt, Coal and Clay! omitted of course in our common school books of Geology. They are 22 Islands large and small, in lat. 61 and 62, between the Shetlands and Iceland, connecting the Geology of both. Iceland is quite Volcanic and yet active. Shetland is primitive;* but the Feroe although Volcanic are not in activity. They have no craters, no lavas, no eruptions; but only the productions of submarine ancient, extinct volcanoes, Traps, Basalts, COAL, CLAY, &c. alternating and intermixed. The stratification is very singular and often quite plain on the sides of ruptured islands, showing 20 to 30 strata of Trap, Basalt, COAL, CLAY, and a porous stone alternating! The Basalts are of all forms, perpendicular, oblique, horizontal, SPIRAL, divergent from a nucleus! &c.

The Coal strata are imbedded in these volcanic formations; the Coal mine of Suderoe is 4000 feet long, 1200 wide, and 5 thick.

Some warm springs are found there, as in all volcanic countries. All the hills and mountains are conical, but without craters as in many submarine volcanoes. The highest is Mount Skœlling, 2240 feet high in Stronove, the largest island 27 miles long.

Let the systematic Geologists explain this if they can, and tell us how Coal and Clay come out of their place, between Trap and Basalt, the newest or superincumbent rocks of theirs: and in islands were no trees can grow! See the translation of Landt, published in London, in 1810.

C. S. R.

* Yet in 1768, a Submarine Eruption of a Volcano near Fetlar Island, in the Shetlands, took place and killed the fish.

13. Arcibites Rhombifera, *a new Encrinite, from the Cabinet of Dr. Cohen, of Baltimore. By C. S. Rafinesque.*

N.G. Arcybites, Raf. Head globular, 4 pairs of nerves arising from the base or concave mark of the broken peduncle, forming eight dichotomous rays on the surface, soon becoming anastomosed and reticulated, with small warts: opening or mouth terminal, round, simple, not quite central.

Spec. ch. of *A. rhombifera.* Quite globular, rays unequal, reticulations unequal, rhomboidal, small warts in the rhombes, none on the nerves.

This fine fossil is 1½ inch in diameter, converted into carbonate of lime. It was found by Dr. Cohen, near Lockport in New York, at the excavations in the geodiferous limestone. The inside is solid. It was unlabelled. My name means net-like head. It is one of the Encrinite head, most like some Echinites, but the rays are not by 5 nor stellated. The small warts may resemble ambulacri; but the umbo of the peduncle is very apparent, round and concave. The Encrinites in fact only differ from the Echinites by being pedunculated.

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14. Lucilites Nigra, *a new univalve fossil Shell, from the Alleghany Mountains of Pennsylvania. By C. S. Rafinesque.*

This pretty fosil is in the Cabinet of my friend Hayden, in Baltimore, who found a single specimen of it, on the side of a limestone cliff at Bedford Springs, in a valley of the Alleghanys of S. Pennsylvania. It was taken 60 feet from the ground. It is the most shining fossil Shell which I have seen, almost as if recent, whence I have called it *Lucilites* or shining fossil. Its black color very unnatural among shells makes a fine contrast with the dull blue limestone in which it is fixed. It belongs to the family of Patellites,

and only differs from Patella, by being elliptical and smooth, without radiations.

G. *Lucilites* Raf. Simple univalve pateloid shell. Elliptical entire, outside convex smooth without radiations, inside concave smooth. No openings nor fissures.

Sp. *L. nigra.* Black shining outside, both ends equal obtuse. Length double of the breadth. Over half an inch in the specimen.

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15. American History—Ancient Chronology of the Onguys or Iroquois.

By David Cusick.

In the traditions of the Tuscaroras published by Cusick in 1827, few dates are found; but these few are nevertheless precious for History.

A small volume has been printed this year by the Sunday School Union on the History of the Delaware and the Iroquois Indians, in which their joint traditions are totally neglected as usual with our actual bookmakers.

Although Cusick's dates may be vague and doubtful, they deserve attention, and they shall be concisely noticed here.

Anterior to any date, the Eagwehoewe (pronounce Yaguyhohuy) meaning real people, dwelt north of the lakes, and formed only one nation. After many years a body of them settled on the river Kanawag, now the St. Lawrence, and after a long time a foreign people came by sea and settled south of the lakes.

First date. Towards 2500 winters before Columbus' discovery of America or 1008 years before our era, total overthrow of the Towancas, nation of giants come from the north by the king of the Onguys, Donhtonha, and the hero Yatatan.

2d. Three hundred winters after or 708 before our era, the northern nations form a confederacy, appoint a king, who goes to visit the great emperor of the Golden City south of the lakes; but afterwards quarrels arise and a war of 100 years with this empire of the south, long civil wars in the north, &c. A body of people escaped in the mountain of Oswego, &c.

3d. 1500 years before Columbus or in the year 8 of our era, Tarenyawagon the first, a legislator leads this people out of the mountains to the river Yenonatateh now Mohawk, where 6 tribes form an alliance called the Long-house Agoneaseah. Afterwards reduced to 5, the sixth spreading W. and S. The Kautanoh since Tuscarora came from this. Some went as far as the Onauweyoka now Mississippi.

4th. In 108 the Konearawyeneh or Flying Heads invade the 5 nations.

5th. In 242, the Shakanahih or Stone Giants a branch of the Western tribe become Canibals, return and desolate the country; but they are overthrown and driven north by Tarenyawagon II.

6th. Towards 350 Tarenyawagon III. defeats other foes called Snakes.

7th. In 492, Atotarho I. king of the Onondagas quells civil wars, begins a dinasty ruling over all the 5 nations till Atotarho IX. who ruled yet in 1142. Events are since referred to their reigns.

8th. Under Atotarho II. a Tarenyawagon IV. appears to help him to destroy Oyalk-guhoer or the Big bear.

9th. Under Atotarho III. a tyrant Sohnanrowah arises on the Kaunaseh now Susquehanah R. which makes war on the Sahwanug.

10th. In 602 under Atotarho IV. the Towancas now Mississaugers cede to the Senecas the lands E. of the R. Niagara, who settle on it.

11th. Under Atotarho V. war between the Senecas and Ottawahs of Sandusky.

12th. Towards 852 under Atotarho VI. the Senecas reach the Ohio R. compel the Ottawahs to sue for peace.

13th. Atotarho VII. sent embas-

also to the W. the Kentakeh nation dwelt S. of the Ohio, the Chipiwas on the Mississippi.

14th. Towards 1042, under Atotarho VIII. war with the Towancas; and a foreign stranger visits the Tuscaroras of Neuse River, who are divided into 3 tribes and at war with the Nanticokes and Totalis.

15th. In 1142 under Atotarho IX. first civil war between the Erians of Lake Erie sprung from the Senecas and the 5 nations.

Here end these traditions.

C. S. R.

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16. American Philology.—Vocabulary of the Yarura Language.—By C. S. R.

The Yarura nation of the Oronoco regions, (also called Jarura, Jaros, Worrow, Guarau, &c.) is one of the darkest and ugliest in South America, some tribes of it are quite black like negroes and are called monkeys. They are widely spread from Guyana to Choco. The following 35 words of their language collected from Gili, Hervas and Vater, have enabled me to trace their origine to Africa.

¶*God.*	Conomeh Andereh
¶*Heaven.*	Andeh.
Earth.	Dabu, Dahu.
Water.	Uy, Uvi.
River.	Nicua.
¶*Sun and day.*	Doh.
Moon.	Goppeh.
Star.	Boeboe.
Fire.	Condeh.
Soul.	Yuaneh.
Wood.	Yuay.
Plain.	Chiri.
¶*Bread.*	Tarab, Tambeh.
Name.	Kuen.
Give.	Yero.
Come.	Manatedi.
Mayze.	Pueh.
¶*Man.*	Pumeh.
Woman.	Ibi.
Father.	Aya.
Mother.	Aini.
Head.	Pachu.
Eyes.	Yondeh.
¶*Nose.*	Nappeh.
Tongue.	Topeno.
Feet.	Tao.
Evil.	Chatandra.
Being.	Abechin. Conom.
Our.	Ibba.
Will.	Ea.
Power.	Beh.
1	Canameh.
2	Noeni.
¶3	Tarani.

Those marked ¶ or 7 out of 34 have some analogy with the English, equal to 19 per cent.

The language of the Gahunas, negros of Choco and Popayan has 50 per cent analogy with the Yarura, since out of 8 words to be compared 4 are similar.

God.	Conomeh. Y.	Copamo. G.
Man.	Pumeh.	Mehora.
One.	Canameh.	Amba.
Two.	Noeni.	Numi.

While the Ashanty or Fanty, negro lang. widely spread in W. Africa has 40 per cent of affinity with the Yarura or 6 words similar in 15 comparable.

Earth.	Dabu. Y.	Dade. A.
Mother.	Aini.	Mina.
Woman.	Ibi.	Bis.
Father.	Aya.	Aga.
Eyes.	Yondeh.	Ineweh
Water.	Uy.	Uyaba.

This is the maximum in Africa. But the language of the Papuas of New Guinea in Polynesia has 50 per cent of analogy, or 6 words out of 12, which is the maximum with the Asiatic and Polynesic negroes.

Man.	Pumeh. Y. / Mehora. G.	Ameneh P.
Woman.	Ibi.	Bienih.
Mother.	Aini.	Nana.
Water.	Uy.	Uar.
Evil.	Chatandra.	Tarada.
One.	Canameh / Amba G.	Amboher.

It may have happened that the Gahunas came from the Papuas through the Pacific; but the Yaruras from the Ashantis through the Atlantic: yet have been once two branches of a single black nation.

17. Botany.—New and rare plants of Maryland near Baltimore. By C. S. Rafinesque.

Many rare or Southern plants begin to appear near Baltimore. I noticed many in 1804 and 1819. Also in my visit and herborizations this year.

Some are preserved in the herbarium collected by Mr. Elias Durand (now of Philadelphia,) presented to the Academy of Natural Sciences of Baltimore, where I saw them. Such are the.

Andromeda marginata of Duhamel.
——— Acuminata? Duh.
——— frondosa of Wildenow.
Ascyrun pumilum.
Inula or Diplogon argentcum.
Chrysogonum Virginianum L. this very rare plant I found in West Virginia also.

In the Herbarium of Dr. W. Fisher of B. are some other rare plants, such as

Helonias angustifolia.
Stachys hyssopifolia.
Calamintha caroliniana.

One of both Herbals were quite new undescribed and nameless. I shall therefore name them and characterize them as follows.

Pyrola (or *Chimaphila*) *durandi* Raf. Leaves few, shortly petiolate, ovate remote serrate, acute, unspotted. Stem naked above uniflore, flower nodding, calyx 5 toothed, obtuse.

Discovered and collected by Mr. Durand. It belongs to the S. G. *Chimaphila* very near to *P. maculata;* but differs by broader unspotted leaves and uniflore stem. Is it a variety of it? Only 4 or 5 inches high, with only 3 leaves, calyx short with obtuse teeth, petals white obovate obtuse, stamens bifid short, stigma sessile thick depressed.

Orchis (or *Habenaria*) *Crocea* Raf. Stem angular, leaves lanceolate acuminate, spike short cylindrical, bracts lanceolate equalto flowers, spur slender equal to ovary, petals ovate acute, labellum nearly similar hardly longer, entire.

Discovered and collected by D. W. Fisher. Very different from *O. ciliaris*, flowers smaller, saffron color, not ciliated. Slender plant 15 inches high. Probably an Habenaria.

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18. Six New Firs of Oregon.

Lewis and Clarke discovered and noticed without names, many years ago, several fine Fir trees of the Oregon or Columbia country. These I named and characterized in 1817 in my Florula Oregonensis, and since sent them to Prof. Decandolle. I now give here my names and specific characters of those 6 new sp. of the Genus *Abies* of Jussieu, &c.

1. *Abies trigona* R. Gigantic Fir (First Fir L. C.) bark and branches scaly, leaves densely scattered, petiolate trigone acuminate and stiff.—Stated to be the largest tree of North America, some reaching 300 feet high, 200 without branches, and 42 feet around. Petiols trigone also, leaves 3-4ths of an inch long, 1-10th wide.

2. *Abies heterophylla* R. Odd leaved Fir (Second Fir L. C.) bark rimose, leaves distichal petiolate very unequal, sulcate above, glaucous beneath, cones terminal ovate minute flexible—Reaching 180 feet high and 6 feet diameter. Leaves from 1-4th to one inch long, but all 1-20th wide. Is it a variety of the Spruce Fir?

3. *Abies aromatica* R. Aromatic Fir (Third Fir L. C.) branches bullate balsamiferous, leaves densely scattered, forming 3 rows, sessile, lanceolate obtuse, flexible, sulcate and shining above, gibbose beneath. Reaching 100 feet high, blisters on the branches filled with a fine aromatic balsam. Leaves very small 1-8th of an inch long, 1-16th wide.

4. *Abies microphylla* R. Small leaved Fir (Fourth Fir L. C.) bark rimose, branches not bullate, leaves densely scattered, forming 3 rows, sessile, sublanceolate acute—Reaching 150 feet high. Like the last, but yielding no balsam, and with

leaves still more minute, not lucid above, only 1-12th of an inch long, and 1-24th wide. Wood white and tough.

5. *Abies mucronata* R. (Fifth Fir L. C.) bark scaly, branches virgate, leaves scattered very narrow, rigid, and oblique, sulcate above, pale beneath. Cones ovate acute, scales rounded nervose mucronate—Rises 150 feet, leaves sub-balsamic, one inch long, 1-20th wide, cones very large two and a half inches long. Var. *palustris*. Grows in swamps, only 30 feet high and with spreading branches.

6. *Abies falcata* R. (Seventh Fir L. C.) bark scaly, leaves tristichal or in 3 rows, in 2 rows upright, in lower row declinate falcate, all linear lanceolate, with trigone petiols. Cones fusiform obtuse at both ends. Only on the sea shore of Oregon, rising only 35 feet, leaves 3-4th inch long, 1-5th wide.

C. S. RAFINESQUE.

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19. ON 3 N. SP. OF CLINTONIA.

Of all the New Genera of Plants which I claim to have established and well named, to few am I more partial than to the beautiful G. CLINTONIA which I published in 1817 in America and in 1819 in France (50 N. G. Journal phys.) of the natural tribe of Asparagides; which I dedicated to my worthy friend Dewitt Clinton, an eminent Philosopher, Naturalist and Statesman. I proved that it differed totally from *Dracena* and *Convallaria* to which 2 Sp. had been united, by a bilobed stigma, bilocular berry and a striking habit. I enlarged besides the Genus by describing 4 sp. of it *Cl. nutans*, *Cl. odorata* *Cl. parviflora*, *Cl. Podanisia* in Ann. Nat. 1820, and I am now going to add 3 more, making a Genus of 7 known species.

It was then with surprise and regret that I have seen another N. G. *Clintonia* lately proposed by an oversight of Lindley, erroneously copied by my friend Torrey. According to the practice of Decandole this G. *Clintonia* of Lindley, must be named anew, and mine prevail, as anterior by 12 years. I have called it protem in my notes *Bolelia* an anagram of *Lobelia* to which it is very akin; but Lindley may frame a better new name for it, if he likes, provided he adopts my Clintonia of 1817.

G. CLINTONIA Raf. 1817 non Lindley 1830.

5. *Cl. Decantha* Raf. Leaves ciliate, Scape elongate pubescent, ombel 10 flowered, pedicles erect pubescent, petals lanceolate acute, stigma bidentate—In the Alleghany mts. of Virginia and Cumberland mts. Four leaves oblong acute.

6. *Cl. Multiflora* Raf. Leaves ample ciliate, scape smooth, ombel multiflore fastigiate, pedicles erect, bracts oblong, petals cuneate obovate acute undulate whitish—This plant I have seen in the herbarium of Dr. Torrey, sent him from England as the *Convallaria umbellulata* cultivated there, and native of Canada. It is totally different from my *Cl. odorata*, and *Cl. parviflora*, all mistaken for that plant. The leaves are large, elliptical acute, scape one foot high, with 12 to 15 flowers, smaller than in the other sp. except *Cl. parviflora;* but this has unguiculate petals. In fact all the sp. of this pretty Genus are much alike in leaves and scape but chiefly differ by the flowers and petals.

In Andrew's Repository fig. 206 the original *Dracena borealis* of Aiton and Solander is figured. Which almost indicates another sp. of this Genus, somewhat different from the *Cl. nutans* and *Cl. podanisia* which have oblong berries, ciliate leaves, &c. I shall notice it protem as follows.

7. *Cl. borealis* or *Cl. aitoni*. R. Leaves undulated, not ciliate, scape flexuose multiflore biombellate, ombels 3-4 flowered, nodding, petals lanceolate obtuse, stigma obliquo truncate dilatate emarginate, berries globular—In Canada 4 leaves.

C. S. RAFINESQUE.

20. On 3 N. Sp. of Eriocaulon.

1. *E. pumilum* Raf. Leaves subulate recurved pellucid acute, convex and striated outside, flat inside. Scape stiff double than leaves, spiraly striated. Capitule hemispherical, scales black obovate obtuse.—Annual like all the Sp. On the Catskill or Kiskanom mts of New York, on the margin of the two lakes, only one inch high. Flowers estival, tricolor, base green, middle brown, top nearly white.

2. *E. filiformis* Raf. Leaves filiform elongate striate, scape subequal round stiff, capitule hemispherical, scales lanceolate obtuse.—In New Jersey and Virginia in swamps. Flowers estival, whitish. Scape one foot high.

3. *E. Spathaceum* Raf. Leaves subulate very short, scape round hardly striate, base spathaceous, spatha bivalve obtuse subequal membranaceous. Capitule spherical white, scales ovate oblong obtuse—From Florida, seen in the herbarium of Mr. Halsey without a name. Scape one foot high.

C. S. Rafinesque.

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21. Erpetology.—On 3 New Water Salamanders of Kentucky.

The Salamanders are very numerous in North America, and although we know now about 40 sp. of them, as many more remain undescribed. Prof. Green has found some new ones this year in West Pennsylvania, among which is a remarkable new Genus with a tubular tongue and callose toes, which he will describe by the name of Glossiphus. I have described already 2 land Salamanders, in N 1 and 2: I will now add a N. G. and 2 N. Sp. of water Salamanders, making 5 from Kentucky. I propose to give hereafter good figures and ample description of them.

N. G. Eurycea Raf. Mouth very large with many rows of small teeth. Opercules a round hole on each side of the neck. Feet with 4 and 5 toes Tail conical carinate above—*Sp. E. mucronata* R. Upper jaw longer mucronate, eyes very small round, body marbled of two shades of brown tail one third of total length—In the river Kentucky. Whole length 21 inches.

The 2 N. Sp. belong to the G. or S. G. *Triturus* (Triton of some but not Lin.) or Salamanders with compressed tails.

1. *S.* or *Tr. lutescens* R. Entirely of a dirty pale yellow, without spots, tail equal to the body.—In West Kentucky in rocky limestone springs in the barrens or glades, 5 to 6 inches long.

2. *S.* or *Tr. nebulosus* R. Blackish with pale or brown clouded spots on the back, tail nearly conical short one third of total length.—In small streams and fissures of rocks in the knobs of West Kentucky, length 3 to 4 inches. C. S. Rafinesque.

Psephides Paradoxa.

22. Conchology.—*A New Tubular fresh water shell of the Alleghany mts.*

I was much gratified to find this year a new fluviatile shell of the simple tubular form; but the animal was not within. It was found in Sherman creek, a mountain stream of Perry County, Pennsylvania, among the Alleghanies.

This strange shell has something mysterious in it. It appears a mass of gravel; strongly cemented, even holding sometimes minute fossil terebratulites and other fossils. It is not therefore the tube of a *Phryganea*. Since they are all brittle, arenaceous or membranaceous. Yet the worm that forms it and dwells in it, (as no molusca form tubular shells) is unknown, and I was told none has ever been seen in it. A singular idea was suggested to me by Prof. Green that it might be a fossil shell! Since it is found in a rich fossil region; and

has a stony appearance; but being found free, in the water or on the banks of the stream, and never imbedded in stones it can hardly be so. The subject must remain doubtful, until other consimilar Genera are found. Meantime I give a figure of it, and its description; whereby it appears to approximate to the Sabellites and other tubular annelides, perhaps also to my G. *Potamiphus* of the R. Ohio, published in 1819, whose worm I detected; but its shell is arenaceous open at both ends and operculate before. My name of *Psephides* means *gravelly tube.*

Psephides. Cylindrical tubular shell, open before, closed behind, opening round entire, inside smooth hard stony, outside entirely formed by cemented gravel and little shells.

Psephides paradoxa Raf. Uncial, diameter equal throughout, about one sixth of length and obtuse, inside brown, outside versicolor.—Length less than one inch. The gravel of the outside is of all colors, formed by small angular fragments of shale, slate, clorite, quartz and other stones *seldom found in Sherman Creek!* and even entire fossil shells or fragments of fossils.

C. S. Rafinesque.

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23. Fossils of Sherman Creek.

I have discovered this year, this new locality for fossil remains, and collected about 50 sp. in a tract of 5 miles near the Kennedy Springs, in the Quaker hills and Mt. Pisgah forming a geological basin of red, yellow, brown and white sandstone, gravel or pebble stone and conglomerate, holding chert of all colors. The fossils are found in all, and even the chert or Petrosilex. They are of the oldest formation.

I mean to give hereafter a full account of this fine oryctological region and all the fossils collected in it. I shall here merely indicate them. Most of them are new.

Vegetable fossils Fucites 2 Sp.

Animal fossils. Porostomites 2 Sp. Encrinites 2 Sp. Turbinolite 1 Sp.

Fossil shells. Orthoceratite 1 Sp. Gryphites 3 sp. Diclisma 3 sp. Productus 6 sp. Terebratulite 8 sp. Eurytes 3 sp. Gonotrema 2 sp. Diclipsites 4 sp. Trunculites 8 sp. Pleureterites 10 sp. &c.

This last is a fine N. G. quite prolific in sp. it differs from Productus by being inequilateral. Nay it may be the type of a new tribe, since one sp. which I have called *Pl. stellata* having a bilobed hinge and a quadrifid shell might also form a peculiar G. *Hemisterias quadrifida.* C. S. R.

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24. Atlantic Review.

42. Sylva Americana by D. F. Browne, Boston, 1832. 1 vol. 12mo. with many wood figures. A useful compilation or rather abridgement of Michaux's trees of North America. The trees omitted by him are also omitted there. No claim to originality—yet extolled in the North American Review!

43. Indian Biography of 200 Indian chiefs, &c. of North America, by Samuel Drake. Boston 1832. A vol. 12mo. 2 fig. A very clever little book or lexicon, partly original, useful for historical reference, and very entertaining withal.

44. Annals of Tryon County in New York, by William Campbell, New York 1831. A vol. 8vo. maps. Containing an interesting account of the settlement of that part of New York, and the Indian wars of the revolution there.

45. Adventures and residence on the Columbia river, from 1812 to 1818, by Ross Cox, New York 1832. A vol. 8vo, Amusing narrative, with some information on the country, fur trade and Indians of Oregon; but little addition to geography and science.

46. Monograph of the Trilobites of North America, by Prof. Green, with casts of all the sp. Philadelphia 1832. A vol. 12mo. Important and original work on these singular fossils, with some N. G. and many N. Sp. but by no means all. We shall notice again this labor if we can.

C. S. R.

ATLANTIC JOURNAL

AND

FRIEND OF KNOWLEDGE:

A CYCLOPEDIC JOURNAL AND REVIEW

OF UNIVERSAL SCIENCE AND KNOWLEDGE:

HISTORICAL, NATURAL, AND MEDICAL ARTS AND SCIENCES:

INDUSTRY, AGRICULTURE, EDUCATION AND EVERY KIND OF USEFUL INFORMATION:

WITH NUMEROUS FIGURES.

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Knowledge is the mental food of man.

It has been impossible to give this year all the articles prepared for this Journal, owing to the length of some, or the nature of others; but by substitutions as great a number and variety has been given. By an oversight the articles have not been numbered in succession as contemplated: this omission is now repaired here.

ARTICLE 88.—PRINCIPLES OF JACOTOT OR HIS SYSTEM OF INSTRUCTION.

This age so fecund in improvements has not neglected to improve education, the great basis of civilization. The intuitive and monitorial plans, those of Pestalozi, Fellenberg, Rensalaer, Lancaster, are real improvements, as well as the Infant Schools, Teachers Schools, &c. But has the system of Jacotot any similar claim?

He calls it, the Natural Method of Universal Instruction and Intellectual Emancipation, a very bold and assuming title; nay he asserts that it is entirely new, while the same principles had long ago been proposed in France, and lately applied by Dufief and Hamilton to teach languages.

The outlines of Jacotot's System have been translated and published in Philadelphia, 1831, by Victor Guillou, divided in 3 parts. 1. Reading. 2. Writing. 3. Vernacular tongue and grammar. It is asserted in addition that every thing can be taught in the same way, geography, history, languages, composition, oratory, mathematics, drawing, music, dancing!!! All this with a single text book, which is Telemachus, although any other widely translated book would answer. Hamilton used the Bible.

Jacotot begun to teach on this plan in 1818 in the Netherlands, where he contrived it in order to teach the French language to the Dutch, although he could not speak Dutch! but has since applied it to every kind of instruction. In 1826 he became the subject of attention, and in 1828 his method was spread through France. Wonders are related of it, in Lyons a whole school was taught to read and write in 15 days! and in 8 months the whole course of education was completed, by a single book! who can believe this?

The principles of Jacotot are chiefly

1. God has endowed the human mind with the power of self instruction—True.

2. The child is to speak what he learns, the teacher to listen and direct—This is done in the Rensalaer school, and many others.

3. A constant repetition of the first words and things learned, is required—This is parrot like.

4. It is needful to commit to memory the 6 first books of Telemachus, word for word without a blunder.—Absurdity!

5. Intelligence is the same in all beings, and therefore the aptitude to learn—Quite false.

6. The improvement of man depends on his will and exertions—But it is also limited by circumstances and physical organization.

7. Every scholar must believe no one born superior to him, and that he is capable to learn any thing by himself—This is faith and pride!

8. Scholars must be praised for their exertions, but no rewards given in schools for better capacity, or efforts, as they are insults on others.—Then emulation is to be destroyed!

9. Nothing else is to be praised but exertions, patience, docility, labor, and virtue.—Thus attention, quickness, good behaviour, cleanliness, care of books, &c. will deserve no praise!

10. Elocution and composition, find all models in Telemachus!—Nonsense!

Every new system is not therefore an improvement. This appears egregiously ridiculous, and calculated at best to make children mere parrots. To teach every thing by Telemachus or any single book, is like teaching geography and history by walking the streets of a single city.

Telemachus may be used to teach spelling, reading, writing and languages like any other spelling book; but other books are required to form the style and clothe the mind. The only useful result likely to come out of this *monobiblic* system, will be that many books shall be translated word for word in interlines, a valuable requisite to understand languages and grammars. We ought to begin by the bible which has never been yet thus translated, although often proposed.

BENJ. FRANKLIN, JUNR.

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89. IMPEDIMENTS TO KNOWLEDGE, LITERATURE AND SCIENCE, IN THE UNITED STATES.

They are so many that a volume would be required to state them at length: we can merely enumerate a few and leave them to the painful reflections of liberality and patriotism.

1. There are no patrons of literature and learning as in some other polished and wealthy countries.

2. Booksellers who are become such elsewhere, do not deserve that name here. Few copyrights are bought except from men of popular fame.

3. This popular fame is not acquired by modest worth or plain merit, but by puffing chiefly.

4. In England patronage, cringing, and flattery are needed to help authors. In France and Germany some merit, besides cabals and intrigues. But here much noise, scribbling, puffing and recommendations.

5. Authors despising these means, have no chance of success whatever be their merit. The best men and writers must use them when beginners.

6. Thus booksellers are enabled to puff and sell the trash they deal in, and pamper or feed the depraved taste of misguided readers: while good books are neglected or not even known for lack of puffers.

7. Reviewers are seldom impartial, being guided by prejudices, predilections and venality.

8. Authors venturing to publish their own works, must pay a tax of 50 per cent to booksellers, or make the public pay it by adding it to cost which is 100 per cent on first cost.

9. A book costing $1, that could be afforded at $2, must be retailed at $3, to enable the bookseller to get their third, or $1 commission without any advance.

10. The interest of money, advertisements, postages, &c. often absorb most of the publisher's or author's profits.

11. The booksellers take little or no trouble with books not their own, they do not even show them unless asked for, and hide them in lofty shelves. Their desks are filled with novels and trash, good and rare books are kept out of sight.

12. Few booksellers have any capital, they deal chiefly on credit or commission, yet pay high rents

for fine stores to make a show, and thus the trade is not safe.

13. If honest men of some capital, and willing to make only 20 per cent per annum in it, were to enter this line of business, a brisk trade could begin under much safer and auspicious terms.

14. A tax of 10 to 20 per cent for advertisements and puffs is required to make any book known, including a copy as a bribe to each editor and reviewer.

15. The taxes on postages amount almost to a prohibition of the sale and transmission of books not periodicals, and of remittances of small amounts.

16. On books published by subscription, a heavy tax of 20 per cent is required to pay those who solicit them, and 5 to 10 to collect the money.

17. Men of Science and learning are neglected by the States and Federal Governments; they are but seldom appointed to stations of trust or profit, although they might be well qualified to become Indian Agents, Commissioners, Consuls, Judges, Postmasters, Agents abroad, Surveyors, Surgeons, &c. according to their advocations, since all learned men are here compelled to follow several pursuits.

18. It is not even the most learned that fill the literary offices in Universities, Colleges, Schools, and Libraries. Three-fourths of the professors, teachers and librarians are mere scholars or plodding men; while the majority at least ought to be men of learning, erudition, science, or genius, to give tone and character to our country.

19. Wealthy men neglect knowledge likewise, very few are to be numbered among authors and patrons. While the less wealthy are impeded by lack of free schools, cheap instruction, large libraries or good and cheap books.

20. Except in a few cities, physicians and lawyers are afraid to appear too learned for fear of losing some of their practice: although they ought always to be respected and rise in proportion to their knowledge and eminence.

21. Many young friends of science or the muses are discouraged by these impediments, their genius is cramped or asleep, they neglect the path to eminence, and prefer a servile plodding life.

22. Out of nearly 50,000 men who have been members of congress or state legislatures, hardly 50 could be mentioned that have been eminent for great knowledge, science, or philosophy, and only 200 who have been eminent orators or improvers of laws, all the rest were partizans, or lawyers, political scribblers, demagogues, sycophants of the people or office seekers.

13. Except Jefferson, Franklin and Clinton, hardly any other very eminent man has reached the executive chair of the states or the nation.

24. Among farmers and mechanics, the bulk, bone and sinew of society, few have attained eminence. Fulton, Evans and Whitney were discouraged by difficulties.

25. Patents, the reward of ingenuity, are useless or nominal: they are purchases of law-suits, since if very useful they are stolen, and if of little use become worthless. This could have been avoided by a previous enquiry and decision on their validity and novelty.

This sad and appaling picture, must cause some painful reflections, we forbear to state them, they will easily suggest themselves. Let us rather enquire if this state of things cannot be amended. We fear not speedily nor adequately; but *nihil desperandum.*

First Corrective. As long as we shall have many citizens depraved by intemperance, notorious vices, bad habits, and ignorance,—*even of reading and writing*....and thus easily led by vicious propensities and designing men, we cannot hope to be a perfect people; but we may

gradually improve by increasing the means of instruction. All voters for instance ought to be able to read and write!

2. As long as slavery and degradation shall exist on this boasted free soil, or a large population be degraded by oppression or else profound ignorance, we cannot even claim to be on a level with those nations that are free from this blemish, which debases both freemen and slaves. But we may gradually change slavery into vassalage, educate every freeman or leave the remedies to those who feel the evil.

3. The monopoly of the booksellers ought to be checked by introducing the hawkers in competition as in France.

4. Their actual practice of republishing only English books to save copyrights, or only a few novels, idle tales, biographies, travels, children and school books besides, may be checked by patriotic associations for publishing nothing but American works.

5. Associations of authors, printers and friends of the country might be formed to form a fund by subscription for this purpose, or to loan funds, to be repaid out of the gradual sales.

6. Agents might be established in every town and village to sell these American works at 10 per cent commission, like every other manufacture, but to prevent collisions these agents ought to sell none but such American works.

7. Authors ought to agree to put no books into the booksellers hands, unless bought, at a discount leaving them from 40 to 60 per cent profit! Surely enough!

8. Wealthy or influential men ought to feel a national and rational pride in fostering American talents and genius wherever met, even under a modest garb.

9. Station of trust or profit, and above all literary stations and collegiate chairs ought always to be given to the most worthy by public competition.

10. The last remedy which we venture to suggest, consists in trying to induce our most ingenious men to endeavor to discover a mode by which a few copies of a work may be printed *as cheap per copy* as when many are printed. Although we cannot now see how this can be done, we know that almost nothing is impossible to modern mechanism and ingenuity. Stereotype printing has enabled to multiply still more impressions it is now required to simplify it by machinery so as to print a few copies at a time whenever required. We have already seen a machine by which a man could print as fast as he could write. If this could be improved and print 10 or 20 or 50 at a time, the discovery would be completed. Its advantages would be incalculable, since it would no longer require a large capital to print a work, but small editions might be printed as often as required.

The inventor of this oligotype printing would deserve ample fame and reward.

B. Franklin, Junr.

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90. Ancient Monuments of Central Pennsylvania by Major Adlum.

Western Pennsylvania has several Ancient Monuments (similar to those of Ohio and West Virginia) near Pittsburg, Meadville, the Monongahela, &c. which are already described; but it was not known that any existed also in the Alleghany mts. Major Adlum who was long a surveyor on the waters of the Susquehannah, furnished me in 1825 with an account of several which he explored between 1792 and 1800 while the country was yet a wilderness. They must have belonged to the oldest Indian tribes of this state, since the villages of the Lenaps who dwelt in E. Pennsylvania are now quite obliterated, being built of less solid materials. C. S. R.

1. E. of Loyalsock creek on the N. side of the W. branch of Susquehannah, elliptical circus or fort, 80 yards long, and 60 wide, ditch outside, parapet inside, gateway S. leading to the river, on which bottom it is.

2. One mile N. side of Pine creek on the W. branch of Susq. R. remains a town, surrounded by a semi circular ditch outside, parapet inside one side straight and 200 yards long, the other curved.

3. Forty rods from Tioga R. on the top of a hill, just at the New York line, oblong square fort 80 yards long, 60 wide, ditch outside, parapet two feet high. Inside several circular holes or foundations of houses.

4. On the great flats of Tioga R. a circular town.

5. At the Shawani flats near Wilkesbarre, remains of the Shawani town, or earlier remains perhaps.

6. At the fork of Black lick and Conemaugh R. a square foot of two acres.

7. Near Milton on W. branch of Susq. R. a square mound of stones, 30 feet long and broad, 8 feet high, with soil and trees on it.

8. On the N. side of Nittany mt. on the path to Bald Eagle nest, a round stone mound 7 or 8 feet high.

9. On Broad mt. between reading and Sunbury another similar stone mound, same height.

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91. Antiquities of East Virginia by Col. Mead.

In 1824, Col. David Mead of Jessamine county in Kentucky, a venerable man born in Virginia in 1744, communicated me some account of the Indians and antiquities of lower or Eastern Virginia.

1. There are some small Indian mounds on James' R. near Monacan 25 miles above Richmond, which have been graves; they are of earth, without any stones.

2. A few similar mounds are found below Richmond, but many more plain Indian graves: the bodies are only one foot under ground. Skeletons of women have been found with necklaces of Buck's horn beads. Many arrows and broken earthenware are found in ploughing.

3. All along the sea shore and banks of large rivers are found many large heaps of shells, oysters clams, muscles, scollops, &c. evidently made by the Indians. They are irregular, 2 or 3 feet thick, covered by a thin soil, the shells are bleached and partly broken. The immense number and extent of these heaps indicates a large population feeding on shell fish.

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92. American History.

The last indians of Virginia, by Col. D. Mead.

In 1727 the state line was run by Col. Byrd between Virginia and North Carolina from the sea to the Blue Ridge. At that time the following nations existed yet.

1. The Nottoways who had a large village on the Nottoway R. a branch of Roanoke R. and near the line. They attended the survey, and soon after many joined the Tuscaroras, to whom they were related by language, and in 1776 emigrated north with them. In 1820 only 27 individuals remained occupying 7000 acres of good land on the Nottoway River.

2. The Meherrins. 3. The Saponis—on rivers of the same names, branches of the Roanoke, near the Nottoways in Virginia; they were already reduced to a few men in 1727, and became extinct in 1750.

4. The Tuscaroras dwelt yet on Dan R. N. Car. or 70 miles from the sea in 1727: they had a town till 1766 when they sold their lands and went to join the Iroquois, to whom the main body had gone before after the war of 1722.

5. Saura or Sara or Cheraw, upper and lower town, 2 towns in N. Carolina 150 miles from the Tuscaroras; they existed yet as late as

1788, when they joined the Cherokis.

6. Nansamonds or Nansamongs, dwelt in the county bearing their name in Virginia. Towards 1740 they joined the Tuscaroras. As late as 1750 they used to fish and winter in Nansamond cy.

7. Pamunkeys, dwelt on Pamunkey R. They are there yet, reduced to a few individuals in 1822. One of them was put in a cage or round house for theft at Richmond, he was very strong and outrageous. A few Nottoways and Pamunkeys wander occasionally through the streets in a degraded state. They have but seldom intermarried with negroes.

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93. The Last Indians of New-Jersey.

In 1802 and 1830 I collected the following information in New Jersey.

The last tribes that remained in the state after the treaties and great emigration of the Raritans, Minisinks, &c. or Northern Indians, in 1758 and 1760, were the following.

1. Manahoking tribe on Manahoking bay now Little Egg Harbor.

2. Malicas, on R. ditto, now Little Egg H. R.

3. Mantas on Ancocus creek.

4. Monolapans on R. ditto now Cranberry R.

All these were fragments of the Naraticong tribe of the Nanticokes of South New Jersey.

They gradually concentrated themselves near Absecum or Great Egg Harbor, and on Balsto R. new Egg Harbor R. at the head of which was their largest village of Shemung, or Chemunk where they dwelt peacefully during the war of the revolution on their reserved land.

Shemung was in the Pine barrens, between Atsion and Tuckerton. The Indians had become christians, they were good neighbors, peaceful, never broke their word and all spoke English. They manufactured baskets for sale and would cut willow twigs any where, which they did not deem stealing, but was not liked by the whites. They often intermarried with the whites, but seldom with negroes.

Although their lands and reservations were unalienable and secured for them in trustees hands, they felt their situation uncomfortable, their land being very poor. Therefore they often applied to the legislature to allow them to sell and buy better lands among the Oneidas of New York.

After many applications and refusals, because all did not agree to the sale, the legislature of New Jersey in 1805 allowed them to compromise, and either go or stay. About 120 sold their shares of the lands and removed to Shemung or New Stockbridge among the Oneidas, led by their Sachem Jacob Skiket, who had been educated at Princeton: Some of them had white women for wives who went along. About 25 refused to go at all and remained on small farms. Of these only 6 remained at or near Shemung of New Jersey in 1830, who work and hunt on the Pine barrens. A few others are rambling through the state, they sometimes come to Philadelphia on a visit, and dress like us.

C. S. Rafinesque.

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94. *Description of an ancient Mexican Historical manuscript.*

By Professor C. S. Rafinesque.

This singular manuscript is preserved in the library of the Philosophical Society of Philadelphia, and is a fac simile of another in Mexico. It was sent I believe by Mr. Poinsett.

It forms a roll about 10 feet long and 8 inches wide, divided into 30 compartiments or scenes or events; from right to left the principal names have been added in our letters.

It appears to relate to some of the earliest migrations of the Mexican nation, since it begins at a navigation by water and terminates at a third Colhuacan, a place of note in early

Mexican History. The times are denoted by feet or steps, or, else by signs of years; but the chronology is rather confuse and obscure.

There is no connected similarity between this historical table and that of Siguenza published by Gemelli, although they begin and end nearly in the same way. Pantitlan and Chapoltepec are the two only similar places in both.

Siguenza famous table relates to the migrations of the Aztlanecas or Aztecas from Aztlan to Mixuahcan, with a chronology of 1608 years at most. This appears to relate to some other tribes of Colhuacans with a chronology less extensive and regular.

To give a full description and comparison of these two interesting manuscripts, with explanations and translations would require a memoir. It is chiefly my intention at present to draw attention on them and suggest a few remarks, on some of the scenes.

First scene, event or place. *Ilhuitl Cacan Chiamoztoc*, (Ilhuitl means the sky or celestial.) This event is represented as in Siguenza by a square sea with a boat, but instead of a man laying down in the boat, are two men standing and paddling, which evidently alludes *to a voyage by sea and from the East or through the Atlantic.* There is besides a teocalli, temple or island in it, with a tree on it, but no bird; and two men below outside one sitting and one kneeling. Date 3 years or balls.

2d. scene. *Panhuataque.* Dates 1 year and 3 feet or steps probably meaning stations of migration.

3. First *Colhuacan* (meaning holy old place,) this is the name given by the Mexicans to the immense ruin of Otolum near Palenque. It is figured by a mountain like a phrygian cap, with 9 tongues or people and 8 speaking sitting men or tribes in a row, 6 steps &c. 3 sheaths or ages next.

4. *Chimalman.* 5. *Quetzaletl.* 6. *Cuduheohilitl.* 7. Cohuatl. Four travellers with loads, a step under each and between each, thus 7 steps or feet or stations.

8. *Onca quitlamanlique nyzcoatl.* A tree, a teocalli, a danse of 5 men, 5 years, 4 steps.

9. *Oncan quinnotz nyzcoatl,* two men, 7 steps 2 before, 2 above, 3 after.

10. *Cuextecatl Chocayan.* 2 cones a man speaking 3 steps.

11. *Cohuatl Camac.* An alligator 4 steps.

Here begin the astronomical cycles of 13 years, figured by symbolic squares. From 12 to 18 scenes nameless.

12. Four men or tribes sitting, 28 years.

13. Four men in a square, 7 steps 24 years.

14. Ditto, 4 steps, 10 years.

15. Ditto, a cornucopia, 3 steps, 5 years.

16. Ditto, 5 years, 3 steps, 4 men beyond.

17. A cone, a sword, 3 tongues, 12 years.

18. Four men, 3 steps, 4 years.

19. *Azcapozalco* (well known city) 4 men, 4 years, 5 steps.

20. *Acalhuacan* or the second *Colhuacan,* 4 men, a spade, 4 years, 4 steps.

21. *Ecatepec* (wind Hill) cone, 4 men, 3 steps, 4 years. Second part 4 men, 3 steps, 8 years.

22. *Cohuatitlan* (snake place) Snake, 4 men, 5 steps, 20 years. 2d. part 4 steps, 4 years.

23. *Teopaiocan.* Cone, sword, 3 tongues, 4 men, 3 steps, 4 years.

24. *Pantitlan* (passage place) divided in 6 parts, all with the 4 men or tribes as usual. 1 has 3 steps, 4 years. 2d. 3 steps, 8 years, and here appears the first symbol of a king sitting. 3d. & 4th. each 3 steps 4 years. 5th. has a sheaf or age of 104 years, 8 years besides & 3 steps. 6th. 4 steps, 4 years.

25. *Atlacuihuaan,* 3 steps, 4 men, 4 years.

26. *Chapoltepec* (Locust hill) 4 steps, 4 men, 20 years, 5 steps. 2d. part below 6 steps round a circle,

2 men kneeling to 2 men sitting, 5 sheaths or ages of 520 years.

27. *Chimalaxotl*, 3 steps, a warrior leading a slave.

28. *Huitzilihuitl*, 3 steps, a warrior leading a slave to the king *Coxcoxth* sitting. This is the *Coxcox* of Aztecas to whom they become slaves, and therefore these annals refer to those tribes who enslaved them, under *Cuxcux* 14th king of the Chichimecas or Acolhuans.

29. Third *Colhuacan*, a mountain, 2 steps, 4 years, 2 men, a vase between them.

30th and last scene or event. Nameless. Three kings sitting, 2 steps, several men, a cone below. End of the whole 3 men and 2 soldiers with swords and tongues.

The whole number of computed years from the 12th scene, amounts to 816 years before the subjugation of the Aztecas and the building or occupation of the third Colhuacan the date of which is in 1314, therefore the beginning of these annals go to the year 498 of our era; but how much earlier in the previous ages is uncertain. It appears that they dwelt 3 ages or 312 years in the first Colhuacan. If the feet or steps denote times or cycles the chronology would be changed and increased. It is desirable that this manuscript should be engraved.

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95. PERUVIAN HISTORY.

Table of the successive Dynasties and Incas of Peru.

This is an extract from my history of the Americans, the authors consulted are chiefly Herrera, Lavega, Acosta, Laet, Valera, Gomara, Polo, Amich, Touron, Garcia.

1st Period. Theogony. 1 God or triad. Pachacamac (world soul) or Pachayaca (world heavenly) or Achachic (celestial creator.)

2. Mamacocha or mother ocean

3. Pachamama or the earth, properly world mother.

4. Apuinti, or the sun, properly father lord.

5. Churi-inti, or son of the sun.

6. Inti-vauqui, or brother of the sun. These 3 deities form a triad or trinity called Tarigatanga, being 3 in 1 or 1 in 3.

7. The moon or Cuilla.

8. The Iris or Alla, Yllapa.

9. God of thunder, air, and wind, Chuquilla.

10. The stars, Chillay, Acllas, the chief Chasca is Venus.

11. Apachitas or tops of mountains.

12. Conapas or Malquis. Spirits, Cupay or Supa is the Devil.

2d Period. Antidiluvian dynasties of Ayar. 1. Cacha. 2. Uchu. 3. Sanca. Great flood of Mamacocha (mother ocean.)

3d Period. Of legislators and conquerors.

1st Dynasty. Collas.

2d Guaricas.

3d Xauxans escaped from the great flood in the mts of Xauxa and Collao, part of the Ritisuyu or mts of snow. Xauxan D. lasted till 1534, last king was Atoya.

4th. Zipanas, of the Collas.

5th. Cagnas, Queens who conquer the Zipanas.

6th. Chon or Con, legislator came from the North, with a nation of white bearded men, who built Tiahuanaco.

7. After a second flood Intillapac, the last king of Tiahuanaco, divides his empire into 4 kingdoms for his 4 sons.

Manco, king of the North.

Colla, of the South.

Tocay, of the East.

Pinahua, of the West.

8th. Cara or Cari, or Pachacam, who came from the South

conquers Tiahuanaco, the Chons banished.

9. Tice or Viracocha I. (man of the sea,) legislator come from the south: since worshipped. Alcavica was king of Cosco.

10th. Viracocha II. Another legislator, came by sea and driven away to sea by the Cagnas or Canaris.

11th. Cagnas queens again in E. Peru. Chapera last 1538. Chimu in W. Peru, lasted till 1408. Chancas in central Peru the last king Hancohuallu leaves Peru in 1350.

12th. Cari and Chipana or Capanac, two kings of the Collas, begin new dynasties towards 840 of our era, and are at war for 400 years till both submit to the Yncas

13th. Tocabo or Royal line, descended from Manco. Several kings mentioned, who reign in N. Peru over the Yuncas, first king Chincha Camac, a legislator, all the kings called Chinchas and Mancu. Rimac was one deified. Cocapac was king towards 1050. Towards 1380 two kings, Chuqui became vassal in 1388, Cuyz in 1402.

4th Period. Dynasty of the Incas or Yuncas or Yncas, or Ingas or Inguas.

1. Guanacaure or Ayarache, of Tocabo race, king of Pacaritambo, his queen Ragua, towards 1080.

2. Aranca, king of Tamboquiro towards, 1090, queen Cona.

3. Manco I. or Maneo Capac, brother of the two last, becomes king of the Quichuas, and built Cusco town 1100. His queen Oello or Colo. His posterity Chima.

4. Sinchiroca, son of 3, in 1137 Queen Cora or Achiola, progeny Raura.

5. Yupanqui I. or Yacarguague or Lloque, nephew of last, in 1167. Queen Cava. Progeny Huaynana.

6. Mayta Capac in 1197. Queen Cuca. Progeny, Urcamayta. Begins to extend the empire greatly over Peru.

7. Yupanqui II. or Pachuti Capac in 1227. Queen Curyllpay. Progeny Aumayta.

8. Yupanqui III. or Roca, in 1527. Queen Micay. Progeny Vicaquirau or Vizaquimo.

9. Yupanqui IV. or Yahuarhuacac in 1305. Queen Chiquia. Progeny Aylli.

10. Viracocha in 1315. Queen Runtu. Progeny Cozco.

11. Urco in 1372. Tyrant so worthless as to be omitted by many, deposed.

12. Pachacutec or Manco II. or Titu-capac, in 1375. Queen Huarca. Progeny Incapanaca.

13. Yupanqui V. in 1425. Qu. Chimpu. Progeny Incapanaca II.

14. Yupanqui VI. or Tupac Yaya, in 1450. Queen Oello. Progeny Capac.

15. Huayna Capac in 1481. Several queens Pileu, Riva, Runtu, Toto. Progeny Tumipampa.

16. Huascar or Inticusi huallpa in 1523. Queen nameless. Progeny extirpated. Deposed by

17. Atahualpa his brother in 1526. Usurper, was king of Quito, killed by Spaniards in 1533.

Second Series of Incas after the Spanish Invasion.

18. Toparpa or Atahualpa II. set up by the Sp. in the N. 1533.

19. Aticoc, set up by the Quitans, nominal for a few days 1533.

20. Quilliscacha, killed by Ruminavi in 1534.

21. Ruminavi, in 1534, inde-

pendent in the Andes for several years.

22. Manco III. son of Huayna, rightful Inca in S. Peru, from 1533 to 1555, called Elinga by the Spaniards.

23. Sayri tupac his son 1555 to 1561. Diego of Sp.

24. Cuzititu his brother 1561 to 1569. Philip I. of Sp.

25. Tupac Amaui I. his brother, 1569 to 1578. Philip II. of Sp. all independant of Spain, in Vilcapampa; last beheaded.

26. Paullu I. Christobal of Sp set up by them at different times in opposition till 1576, was son of Huayna.

27. Paullu II. Carlos of Sp. his son, from 1576 to 1586.

28. Paullu III. Melchior Carlos son of last 1586, exiled to Spain in 1602, dies there of grief 1610.

Interregnum, but Incas acknowledged secretly by the Peruvians.

29. Mangore 1674, revolts in the Andes.

30. Torote, secretly from 1712 to 1737, became independant in Andes till 1740.

31. Apu or Huaynacapac II. Juan Santos of Sp. independent in Andes from 1742 to 1755, when sent to Spain.

22. Tupac Amaru II. Cordodanqui of Sp, independent in the South from 1780 to 1782.

33. Tupac Amaru III. his brother and successor 1782.

34. Pumacagua, revolt in 1813.

35. Manco IV. or Yupanqui VII. was Inca Protector General of the Indians appointed by Patriots in 1818.

36. Lauricocha, short revolt in 1828.

The series of Spanish kings and viceroys of Peru belongs to the colonial history, the series of late independent rulers and presidents of Peru and Bolivia, belongs to their late independent history. *C. S. Rafinesque.*

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96. American Languages.

Wahtani or Mandan.

The vocabularies of languages collected by Lewis and Clarke, in their memorable journey to the Pacific Ocean, appear to have been lost and never published. It is said they were put into the hands of Dr. Benj. Barton, who made no use of them; since his death they have disappeared, and cannot be traced any where.

I met in Lexington, Ky. Mr. George Shannon, who was one of the companions of Lewis in that voyage, and who furnished me with some words of the Mandans on the Upper Missouri, who he said call themselves *Wahtanis*, these added to a few scattered in Lewis' Travels, form the following 32 words.

	**Father*		Papa
	Mother		Nayeh
	**Man*		Numakeh
	Woman		Mikheh
	Water		Minih
	God		Hupanish
	Hill		Naweh
	Village		Ahmah
	Meat		Mascopi
	Corn		Cohantek
	Cold		Shinihush
	White		Shahar
	Black		Sahera
	Red		Nopa
	Knife		Maheh
	**No*		Nicosh
	Big		Ahinah
	Little		Hami
	Fox		Ohhaw
	Cat		Poscop
	Wild Sheep		Ahsatah
	Mocasin		Orup
	Wolf		Shekeh
1	Mahanah	6	Kimah
2	Nupah	7	Kupah
3	Nameni	8	Tetoki
4	Topah	*9	Macpeh
5	Kehun	10	Pirokeh.

The 4 words marked * have some analogy with the English, through remote courses as usual, equal to 12 per cent. of mutual affinity.

This language is totally new to the learned, it is found in none of the great philological works. It is stated by Lewis to differ widely from the Minitari, allies and neighbors of the Mandans, although a dialect of it; both are referred to the great Pakhi family of the North, themselves a branch of the Skereh or Panis group of nations and languages. But this surmise appears to me erroneous, I can see but little analogy with the Panis and Ricara dialects; but instead, many similarities with the Yancton and Konzas dialects of the Missouri tribes. The Wahtasuns or Ahnahaways of Lewis, called Ayawahs by Shannon, are a branch of the Otos and Ayowehs of lower Missouri, although settled near the Mandans, and speaking an akin dialect.

The word mini for water is found in all the Missouri tribes. In comparing the 10 Mandan numbers with the list of decimals in 50 N. A. dialects in Tanner's Narrative, the greatest amount of analogies are found in the

Konza 1. Meakche, 2 Nonpah, 3 Topah. Analogy 30 per ct. nearly the same in Omawah.

Yancton 1 Wanchah, 2 Nonpah 3 Yahmene, 4 Topah. Equal to 40 per ct. the same in the Dakotah or Sioux.

Minitari 2 Nohopah, 3 Nahme, 4 Topah, 5 Chehoh, 6 Acahme, 7 Chappo. Equal to 60 per cent. of analogy.

While the Pani has only 10 p. cent of analogy by the single number 2 Patko. The Muscogih more far to the S. E. has even more or 20 per ct. in 1 Homai, 10 Pekole; but they are very remote.

Mr. Catlin, who has visited the Mandans this year, 1832, says they are properly called *Siposka-nukaki* meaning people of the pheasant! thus we have 3 names for this nation, this is not unusual, each nation having many nicknames in N. America. He says they are reduced to 1800 souls, and that the Minitari speak a dialect of the Upsaroka or Crow Indians.

C. S. Rafinesque.

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97. Languages of Oregon. Chopunish and Chinuc.

Mr. Shannon confirmed the fact that only 3 languages were met with in the Oregon mts and country. 1 The Shoshonis in the mts, 2 Chopunish from mts to the falls of the Oregon or Columbia R. 3 Chinuc from hence to the Pacific Ocean. But they are spoken in a multitude of dialects.

The Shoshoni is pretty well known to be a branch of the Alietan or Western Skereh, spoken as far as Mexico. The other two are less known. Mr. Sh. could only furnish me 12 words of Chopunish, a few more met with in Lewis and Cox enable me to give 24 words of it.

Sky	Tetoh
Water	Mekish
River	Ishkit
Land	Kaimo
†*Father*	Papa
Son	Illim
†*Sun*	Spokan
†*Faraway*	Wayot
†*Nose*	Nashne
Arm	Tunashe
†*Head, top*	Chop
Flat	Unish
Cut	Pakehuk
Broken	Mutult
Road	Ahish
Buffaloe	Cokala
Bear	Yahar

Kall	Tim.
1 Nox	4 Pilapt
2 Lappit	9 Quis
3 Mutat	†10 Potemt

It is singular that this uncouth language has six analogies † out of 24 with the English, by primitive connection, equal to 25 per cent. It is therefore Asiatic like the Saca or old Saxon.

I am at a loss to refer it to any group of American languages, I had put it among the Wakash or Nutka group in my table; but it is widely separated from it. New to science as well as the next.

Of the Chinuc I have collected 33 words from Cox, Lewis, and other sources. Cox calls it unutterable and says it lacks F. V. R.

Chief	Tia, Taye
Good	Clouch
†*Cake*	Pacheco
†*Island*	Ela
Gods	Etalapass
	Etanemi
Men	Tillikum
Give	Pattach
†*I, me*	Maik
There	Kok
Sit down	Mittait
I do not understand	Wake Comatox
†*Whale*	Ecola
Money	Haiqua
Beads	Comoshuk
Dog	Camux
Deer	Mulak, Lap
Bear	Host
Salmon	Equannat
Tobacco	Quayenult
Pipe	Kulama
Gun	Sakqualal
Blanket	Poclishqua

The decimals I have in two dialects.

1	Ect, Icht
2	Moxt, Makust
3	Clunc, Thlown
4	Uct, Lakut
5	Quanim, quanum
6	Tuckum, Tackut
7	Sinanixt, Sinbakust
8	Stutkin, Stuktekan
9	Quayels, Quayust
10	Taitlelum, Italilum.

The 4 marks † indicate 4 in 33 of analogy with the English, equal to 12 per cent.

3 words, man, 9 and 10 have a slight analogy with the Chopunish out of 9 in the two lists, which gives 33 per cent. of analogy.

North of the Chinuc and Chopunish are found the Wakash and Atnah tribes and languages, the last has many dialects connected with the western Lenilenap group and it appears that both the Chinuc and Chopunish have more analogies with them than with the Wacash; the word man is an instance and proof of it.

In the Wacash the numbers have some slight affinities with those of the Onguys and Wiyandots of the East, while in the Chinuc and the others, these decimals resemble the Shawani and other Eastern Lenilenap Dialects. Examples.

Musqnaki. 1 Nekot, 4 Kotwauskik, 5. Kotwauswa, 9. Shaunk. 4 in 10 or 40 per cent with Chinuc.

Shawani. 1 Nguti, 5. Niniaswi, 6. Kukatswi, 10. Matatswi, also 40 per cent.

Mohegan. 1 Ugwito, 5. Ntnoa 6 Ugwitus, 10 Netaumit also 40 per cent.

I conclude therefore that the Chinuc (and perhaps the Chopunish also) is one of the Lenapian languages of the West, one of the fragments of that vast ancient nation that has spread from the Pacific to the Atlantic Ocean in 200 Nations and tribes. The Ainus of Eastern Asia appear to be their ancestors.

C. S. Rafinesque.

98. Geology of Natchez.

The following information on the cliffs of clay on which Natchez is situated was imparted to me this year by Dr. James Smith of Baltimore.

These cliffs are about 220 feet high in 5 strata.

1. Soil 4 feet thick.

2. Marly clay 80 feet thick.

3. Bank of clay and shells 25 feet; the shells are of several kinds, chiefly a white univalve like Helix but larger, and a bivalve, both soft not flinty. The bivalve is a new *Diclisma. D. teres* Raf. Subcylindrical, 2 inches long, fulvous, breadth 1-3d of length.

4. Pure marly clay again 100 feet thick.

5. Bank of 20 feet down to the river shore, gravelly or clay mixt with rolled silicious pebbles. Many are of yellow Calcedony, black and red jasper, or some very curious stones, for instance.

Gravel stone with impression of wood on it!

Red and yellowish chert with impressions of shells.

Fragments of pumice stone.

Beautiful onyx pumice. Outward coat like iron grey hornstone, compact smooth without holes, one line thick. Inside porose light with unequal holes, of a fine purple with shining vitrified specks. Next a band of greenish and another rusty or brick color at the other end. Thus this fine stone has 4 colors, iron, purple, green, and rusty.

Fragments of pseudo volcanic glass. One somewhat like jasper was grey inside but shining black outside as if glazed.

99. *Geological Remarks between Buffaloe in New York and Pittsburg, in Pennsylvania.*

By David Thomas.

Buffaloe is on Lake Erie at the mouth of Buffaloe creek, in a level rocky plain extending 16 miles E. The rock is limestone and horizontal, it extends to the Canada side where it is more broken. The valley of Buffaloe cr. is wide and of yellow clay. The shores of Lake Erie is low, of miry clay, mixt with sand and gravel. Three miles from the creek the soil becomes firm, and wells are dug under it in slate. The first bluff on the Lake is also of this slate or argillite.

At eighteen miles creek, a thin stratum of limestone, which once overlaid the crumbling slate, has been broken into angular fragments with square edges to the margin of the Lake. The hills of slate begin to become steep; it is nearly black, resembling coal, but in thin lamina, some even flames in a hot fire, some are iridescent, or a yellow substance is found between the leaves.

Beautiful pebbles decorate the shore of the Lake, they are primitive fragments of many colors.

Springs of petroleum are found a few miles inland, and coal will perhaps be found hereafter.

Many bluffs project in the lake in deep water, yet it is said that formerly there was a passage or road at their foot, and that the lake has encroached there. Purplish ferruginous sand is found on the shore between them. The bluffs are slaty and hardly 100 feet high. Blocks of granite and limestone of many tons are numerous on the shore. Some singu-

lar limestone masses are seen, resembling huge fossils, like oblate spheroids of stratified lime, others 5 feet diameter and one thick with concentric circular ridges like a Boletus. The lime contains white and black crystals in the fissures, and the slate contains Pyrites.

Before Cattaraugus creek a tract of clay is found, with many ponds and sloughs. Beyond the creek the shore becomes very shallow, and with sand downs 50 feet high, formed by drifts, and as white as snow.

From Walnut creek to Erie in Pennsylvania, the road for sixty miles is on a broad ridge parallel with the Lake, but 2 or 3 miles distant, formed of loam and pebbles of mica slate. The first appearance of this primitive rock in place is at a quarry 12 miles from Cattaraugus nearly South, but the Chatauque mountains now in sight appear to be formed of it at their base.

At the Canadaway creek these mountains begin to run parallel with the Lake Ridge, 5 or 6 miles only from Lake Erie; on their top is the Lake Chatauque which empties the waters into the Ohio, They are the N. W. end of the Alleghanies as the Catskill mts. are their N. E. end. They are about 1200 feet high, and the small streams running from them to the Lake, are over the mica slate.

At the twenty-mile creek, the valley interrupts the mts. and on its banks horizontal strata of mica slate are seen 50 feet high above the water.

Here begins Pennsylvania.

As far as Erie, the Argillite covers the mica slate, which appears again near Erie where a quarry of it is used. Boulders of granite are seen on the shore but no limestone.

It is 14 miles from Erie to Waterford on Lebeuf creek over the mountains. The road ascends for 8 miles over successive ridges, disposed like an amphitheatre, with steep slopes towards the Lake. These mts. extends S. W. into Ohio but recede from the Lake gradually. Lebeuf cr. rises in Pine swamps, and its waters are of a dark color. It empties into French cr. a large stream or rather river in a broad valley.

Meadville 40 miles from Erie is in a plain with a gravely loamy soil. Some granite boulders seen on the uplands.

Fourteen miles S. of Meadville ends the mica slate region and begins the sandstone region supporting coal, limestone and iron ore. The sandstone hills and ridges run from E. to W. and are 16 miles broad from N. to S. Some sandstone is white, quite crumbling and similar to salt. Some limestone strata of a bluish white are found. Scrubgrass cr. and Little Sandy cr. have iron beds.

The valley of Slippery rock cr. is S. of these hills, and opens to the W. The strata are horizontal. Limestone is seen below the sandstone, and coal near the surface.

Conoquenessing cr. has coal mines on its banks under clay slate. The valley has high hills on each side of quartzote grit with mica in it. Four kinds of iron ore found there honeycomb gravel, bog and metallic ores.

From hence to Pittsburg the country is very hilly, the sandstone, limestone, coal, and iron

are found every where, and on the top of each hill a kind of greasy ochraceous earth.

100. ORYCTOLOGY.

Vulgar names of fossils and petrifactions in North America.

The common names given to those objects by the illiterate and ignorant of geology throughout the United States, are of some importance, because they indicate or lead to detect the localities for fossils, as well as to correct the curious mistakes and misnomers of the vulgar language on that score. I have therefore collected several of the names which I have thus seen applied. The adjective appellation *Petrified* is commonly prefixed to all of them, thus

Petrified snakes, or coiled snakes are *Ammonites.*

Rattle snakes or petrified rattles are *Orthoceratites.*

Petrified fishes are the inside of the same.

Petrified crabs and beetles are *Trilobites,* called snake heads when contracted.

P. turtles are *Septaria.*

P. butterflies are *Productus.*

P. wasp nests are *Favosites.*

P. buffaloe horns are large *Turbinolites.*

P. dog teeth are *T cynodon.*

P. giants bones and teeth are *Mastodon* and elephants.

P. men's heads are *Nodulites* and *Pithecites.*

P. knives or bills or penis are *Belemnites.*

P. roots and bark are *Alcyonites.*

P. brakes are *Filicites.*

P. screws are *Encrinites.* P. buttons the same when the articulations are loose.

P. eyes or ringstones are *Cyclorites.*

P. stars or sea stars are *Pentacrinites.*

P. stars or star stones are *Madreporites.*

P. corals and thimble stones are *Milleporites.*

P. almonds are *Diclisma* and *Nuculites.*

P. hickory nuts are *Pentremites.*

P. acorns are *Cupulites.*

P. elk horns are *Somarites.*

P. deer horns are *Mazamites.*

P. snails and cockles are univalve shells.

P. clams, muscles, oysters &c. are bivalve shells.

P. tongues are shark teeth.

P. walnuts or balls are *Bolactites.*

P. sponges are *Cavulites* or *Spongites.*

P. birds nests are *Antrosites.*

P. eggs or egg stones are *Geodites.*

P. fish roes are *Oolites.*

P. reeds or grass are *Coal phytolites*

P. snake skin are *Lycopodites.*

P. nets are *Tesselites.*

P. sheep's horns are *Spirulites.*

P. needles are *Spinulites.*

P. olives and pecan nuts are spines of *Echinites.*

P. turnips are *Lamellites.*

P. chains are *Catenularia.*

C. S. R.

101. Ancient Volcanoes of North America.—By C. S. Rafinesque.

America will upset many of the theoretical doctrines of European Geologists, and so will Africa when explored by them.

The highest mts. were said to be of granit every where; but the highest in the world, those of

South America are of Porphiry, those of Central Asia still higher are of stratified primitive rocks jumbled like marble paper.

The great geological question of the igneous or aqueous origine of the globe and the primitive formations is now pretty much at rest. It is become more important to ascertain the origine of the secondary formations, with their immense stores of life and organic remains, therein entombed.

The theorists once sustained that all the limestone had been made up of shells by compression although we have primitive and volcanic limestone without shells. Now they maintain that all the coal formations are made up of wood by compression, because the lignite is thus formed, but the primitive and volcanic anthracite and bitumite without any trace of wood upsets this theory also.

No one can be a good geologist without having seen volcanoes, or at least without having studied well their actual operations throughout the globe. After seeing the huge volcanoes of South America throwing yet streams of water, mud, clay, sand, marl, bitumite, pichstone, &c. instead of melted stones, while the same happens also in Java, Spain, Sicily, Russia....Humboldt could well account for many ancient geological phenomena, and he was even led to surmise that the great Asiatic flood was caused by a volcanic eruption of waters from the Caspian Sea. If this should be confirmed by inspections, we may well surmise that our great flood of North America, traced by our diluvial formations, was also caused by eruptions from our great Northern Lakes.

Volney was the first to call Lake Ontario a volcanoe! and to notice our ancient mountain lakes now dried up, by eruptions or convulsions, each having a breach or water gap. I am induced to amplify his views by deeming nearly all our lakes, as many volcanic outlets, which have not merely thrown waters in later periods but in more ancient periods have formed nearly all our secondary strata by eruptions of muddy water, mud, clay, liquid coal, basalts trap. This was when the ocean covered yet the land.

Submarine or oceanic volcanoes exist as yet every where in the ocean, & their effects are known. They must of course be hollow outlets under water, that would become lakes if the ocean was dried up. We can form an idea of their large number and extent by the late but natural discovery, that all the Lagoon Ids, and circular clusters of Islands in the Atlantic, Pacific, and Indian oceans are volcanic craters! This is now admitted even in England, and the coral reef often crowning those clusters are later superincumbent formations by animals. The Bahama Ids in the Atlantic, the Maldives near India, and the Coral Ids. all over the Pacific are the most striking of these singular volcanic clusters, nearly at a level with the ocean. Some of them are of immense extent from 60 to 150 miles in circuit, or even more.

Some circular bays and gulfs of the sea appear to be similar, differing by having only one breach. The bay of Naples is one also, an ancient crater, with islands in front.

The analogy between lakes and volcanic craters is obvious. Al-

most all firy craters become lakes filled with water, when their igneous activity is spent.

All springs are smaller outlets of water, while the fumaroles and holes of igneous volcanoes, are small outlets of smoke, fire, air, gazes, hot mud, &c. I can perceive no essential difference between them or any other eruptive basin, except in the degree of caloric or kind of matter which they emit. They may both be quiescent or in activity. Springs vary as much as volcanoes. We have few pure springs they commonly hold mineral substances; they are cold, warm, hot, salt, bitter, saline, bituminous, limpid, colored, muddy; perpetual or periodical, flowing or spouting. Just like volcanic outlets.

Therefore volcanoes are properly igneous springs, and springs or lakes are aqueous volcanoes!

Under this view, we have no lack of volcanic outlets in North America, since one half of it, the whole boreal portion, from New England and Labrador in the East, to North Oregon and Alaska in the West, and from Lake Erie to the boreal ocean, is filled with them, being eminently a region of lakes and springs: covered with 10,000 lakes at least.

To these as well as to the dry lakes of our mountains, the limestone craters and sinks—may be traced as the original outlets of our secondary formations, in a liquid state under the ocean, imbedding our fossils. The basaltic, trapic and carbonic formations have the same origine, since they are intermingled. But some kinds of sands and clays have been ejected since this continent became dry land.

To trace all these formations to their sources, delineate their streams or banks, ascertain their ages and ravage on organized beings, will require time, assiduity, zeal, and accurate observations.

What connection there is between lakes or dry basins of primitive regions, and their formations is not well ascertained. Some are evidently the produce of crystallization; but others forming streams, veins, banks and ridges may have been ejected in a fluid or soft state before organic life had begun, and thus spread into their actual shapes. Many streams of primitive limestone, anthracite, wake, grit—are probably so formed and expanded. Hollows in the primitive ocean must have been the outlets of these substances, now become lakes after the land became dry.

The power which rises and ejects out of the bowels of the earth, watery, muddy and solid substances, either cold or inflamed is one of the secrets of nature; but we know that such a power or cause exists, since we see it in operation. Water rises in lakes and springs much above the level of the ocean, while the Caspian sea is under that level. There is then no uniform level for water on the globe, nor uniform aerial pressure over them. Another cause operates within the bowels of the earth to generate and expel liquid and solid substances, perhaps many causes and powers are combined there. Galvanism is probably one of the main agents. A living power of organic circulation, would explain many earthly phenomena.

The great astronomer Kepler and other philosophers, surmised that the earth was a great living

body, a kind of organized animal rolling in space. According to this theory lakes and springs would be the outward pores vents and outlets of this huge being, volcanoes inflamed sores and exuvia, water the blood or sap of the earth, mountains the ribs, rivers the veins. This whimsical conceit is not preposterous since we know of animals perfectly globular and somewhat like our globe, the Tethya and Volvox for instance. But it is only a theoretical surmise, I merely mention it as an illustration, and the conception of some great minds; perhaps a more rational idea than the theories deeming this globe a mass of inert matter, a globular crystal, or a hollow sphere suspended in space, or a rolling ball whirling round the sun.

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102. MINERALOGY.

Oolites of North America.

A great confusion has arisen concerning this mineral rock because scarce, denied to us by many who have not seen it, and mixt by others with chalk and grit under the name of Oolitic rocks.

Chalk is compact and white, not in round grains like the true Oolitic rock, it has not yet been found in America.

Limegrit or silicious limestone has grains of quartz bound by lime. It is a kind of grit or sandy rock, and not of Oolitic rock as erroneously stated by Eaton; it is not uncommon in the Alleghany mts. and West of them.

The true Oolitic rocks are calcareous and formed by globular grains or crystals either solid or hollow.

The true Oolite or Roestone has those grains spherical, more or less hollow, commonly white. They have been mistaken for petrified roes of fishes by the vulgar, and by the system mongers who would not believe in round crystals. They are however perfect crystals of pure lime, conglomerated into extensive rocks and strata.

I have found it in South Kentucky, in the basin of the Cumberland R. (not the valley) S. of the Knobs between Glasgow and Bowlingreen. It was perfectly white, the hollow grains of the size of millet. It is scattered on the ground in angular flattened fragments; but in digging for wells a thin stratum less than a foot thick is found above the compact limestone rock.

This formation must be connected with that of Tennessee, mentioned in the late geological map of that state, to be found in several parts of the S. Cumberland basin, and besides on the very top of the S. Cumberland mountains, overlaying there the gritty sandstone.

The other Oolitic rocks found in Europe are 1. The *Pisolites* or Peastone, with grains solid like peas. 2. *Meconites*, as minute as poppy seeds and nearest to chalk. 3. *Ammites*, from the size of a nut to 3 feet in diameter formed by concentric spheres united by rays. These are deemed organic remains by many near to Ammonites and Numulites. 4. *Granulites*. Round grains filled and bound by a silicious matter.

These have not yet been found with us; but Dr. Powells of Baltimore has shown me another, found by him in Pennsylvania, very near the *Granulites* but not silicious. It must form a 5th Oolitic rock which I shall call

Pantolites or Powelstone. It is grey filled with minute bluish round oolitic spots not larger than millet, these round grains are solid: the general fracture is angular as usual. It occurs near Milton above the Red Shale, in large nodular masses in place, and also near Easton but in fragments out of place probably diluvial. Dr. Powell thought this the true Oolite, but it is quite different from it.

Oolites are also indicated as found in New Jersey, New York and Ohio, but unless properly described it is not possible to aver which kind is meant.

C. S. R.

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103. The Fishes of the United States.

Many splendid works have been published on our birds; but none yet on our beautiful and valuable fishes. I have long had in contemplation a general history of our finny tribes, after describing 100 N. Sp. of fish in the single river Ohio; but such works are not yet sufficiently patronized. Lesueur who had collected so many beautiful drawings of our lake fishes, has never been able to publish them. Dr. Dekay of New York once told me that he had begun a natural history of our fishes, which has never appeared. I am told that Dr. Holbrook of Charleston is writing the history of our Southern fishes. Much remains to be done in this branch of Natural History, and to prove it, it will be sufficient to state that I have discovered and figured already 900 N. Sp. and many new genera of fishes from the river Ohio and branches, Mississippi, Potomac, Susquehannah, Delaware, Hudson, and Lake Erie and other lakes, the Atlantic Ocean, &c.

In August 1831, in my fifth Zoological letter to Cuvier 3d series, I informed him that we had about 1000 species of fishes in our streams and lakes, of which 700 are yet undescribed, and I determined their stations as follows, dividing them into 10 ichthyological regions of fresh water, each having a peculiar generation of finny tribes.

1. Region. Of the Great Lakes St. Lawrence & affluent streams.
2. North Atlantic Region, from Maine to the Chesapeak, Hudson, Connecticut, Delaware and Susquehannah Rivers.
3. South Atlantic, from the Chesapeake and Potomac to Florida.
4. Florida streams and lakes.
6. Mexican gulf, streams and rivers of Alabama, &c.
6. Louisiana or Lower Mississippi, Red R. Arkansas, &c.
7. Ohio and branches, Tennessee, Cumberland, &c.
8. Upper Mississippi, Illinois, and branches.
9. Missouri & affluent streams.
10. Region of Oregon, in the R. Oregon and branches.

All these Regions have each at least 150 species of fishes, and deducting 1-3d from each for those few common to several regions, 1000 sp. will remain in the whole. The regions 4, 5, 6, and 10 are entirely unexplored by science.

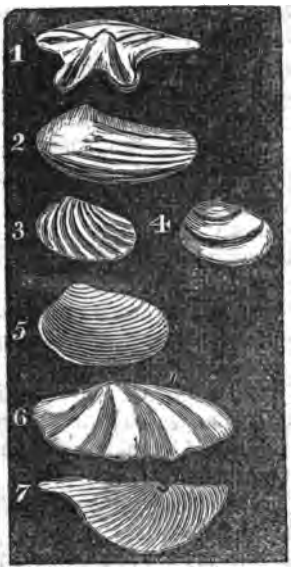
To these 10 regions of fresh water fishes, we must add three regions for sea fishes.

1. Atlantic Region.
2. Southern Region.
3. Mexican gulf.

Each must afford 200 or 300 sp. many of which must be new,

those of the Mexican gulf have never been attended to as yet. Thus we have 600 to add to the 1000 above, and may expect to have 1600 sp. of fishes to describe and figure of which 1000 are new! to the science. Yet all are valuable, since they afford food, fisheries and sport.

C. S. R



104. *New Fossil Shells of Pennsylvania, by C. S. Rafinesque.*

Among the 40 N Sp. of Bivalve fossils found this year on Sherman cr. in the Alleghany mts. I select those which are unequilateral as the most curious, and I shall describe 10 of them giving above the figures of 7, ranged under 3 new genera. All are Inequivalve.

1. N. G. HEMISTERIAS Raf. Shell transversal with 2 wings thus unequilateral, hinge with two teeth and an angular sinus outside at the beak, margin lobed——*H. quadriloba* fig. 1. Four obtuse lobes and 3 obtuse sinusses, lateral lobes like wings one much longer, an oblong furrow on each lobe, length half of breadth.

2. N. G. TELISTROPHIS Raf. Shell unequilateral transversal with one wing on the longest side, hinge without beak, streight with a round impression inside at the apex, margin unlobed—*T. torsala* fig. 7. Shell convex, minute longitudinal curved strias, short side rounded, long side with a twisted obtuse wing, length 2-5ths of breadth....Impression in Petrosilex. one inch.

3. N. G. PLEURETERITES R. Shell unequilateral transversal without wings, hinge more or less curved simple or with a wrinkle and a beak, margin unlobed—The name means irregular sides, *Telistrophis* means spotted hinge, and *Hemisterias* means half starry....8 sp.

1 Sp. *Pl. lateristria* R. fig. 2. Shell oblong, small side smooth, longer side with 5 transversal furrows, axis far behind, length one third of breadth....In petrosilex, one inch long.

2 Sp. *Pl divisa* R. Shell oblong divided in the middle by a large furrow and small sinus at the end of it, 5 curved ribs on the small side, 7 on the large divided by deep furrows, small side rounded, longer attenuate, axis proeminent submedial, length half of breadth ....In grey petrosilex, over one inch.

3 Sp. *Pl. anisocta* Raf. Shell swelled rounder, a deep furrow in the middle, 8 curved unequal ribs, 4 on each side, small side round, longer side truncate, beak proeminent submedial, length 3-4ths of breadth....In variegated petrosilex, about one inch.

4 Sp. *Pl. latiundata* R. fig. 6.

Shell oblong both ends obtuse, 3 or 4 broad waved ribs, margin flexuose, beak submedial, length 2-5th of breadth.... With the last larger.

5 Sp. *Pl. striata* R. Shell oblong, swelled both sides rounded, hinge flexuose by arched beak, equal longitudinal strias throughout, beak submedial, length half of breadth... In white sandstone, nearly two inches.

6 Sp. *Pl. bifasciata* R. fig. 4. Shell rounded swelled, smooth with two faint transversal bands or wrinkles, beak round lateral, length 2-3ds of breadth... In yellow sandstone, small, half an inch.

7 Sp. *Pl. concentrica* R. fig. 5. Shell oval, minute concentric strias, beak obtuse at 1-3, sides rounded, length 2-3ds of breadth ....In petrosilex.

8 Sp. *Pl. obliqua* R. fig. 3. Shell oval oblique swelled, 8 curved oblique furrows, 3 and 4 on the sides of the middle one, beak proeminent at 1-3, length 2-3 of breadth.... In grey chert or petrosilex, small half an inch, near to sp. 3, but less deeply furrowed not truncate behind.

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105. Stratipora and Flexulites N. G.

These are two N. G. of fossil polypites of my cabinet. Both are from the fine fossil regions south of the Apalachian mts. where so many new shells have lately been found. They are not silicified.

1. Stratipora Raf. Mass of Basaltic angular cells like Favosites, but short not concamerated, top with several regular rows of equal round pores like Millepore each corresponding to a tube.... Very singular N. G. with the general form of Favosite, and the internal structure of Millepore tribe.

Sp. *Stratipora brevissima* Raf. Basaltic pillars not striated commonly hexagone, 2 opposite sides longer, even at top, but unequal in length beneath, forming an extended flattened level mass. From Louisiana near the River Teche, specimen 4 inches by 3, pillars from 1-4 to 1-2 inch long only, of a greyish color, marly smelling of clay but very hard, ceded to me by Professor Green, who deemed it wrongly a Tubipore.

2. Flexulites Raf. Body fixed obconic, outside with a thin tegument covered with flexuose wrinkles, inside solid filled with minute transversal flexuose fibres or strias.... Another very singular and anomalous N. G. akin to the Madreporites, but no stellated mouth, inside not radiated, but irregularly flexuose. Perhaps it is a fossil Porostome or animal without mouth as Tethya, &c.

Sp. *Flexulites haydeni* Raf. Body obconical truncate, subaggregate, outside flexules transversal, each raised and with a furrow on it, internal flexules intermixt becoming less near the surface.... Specimen 4 inches long changed into a silicious grey slate, upon a rusty slate, from the region south of the Apalachian in Alabama. Ceded to me by Mr. Hayden to whom I have dedicated the sp. C. S. R.

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106. New Lizard from Kentucky.

It was observed in 1823, on the Knobhills of West Kentucky not far from the Mammoth cave. It is called scorpion and erroneously deemed poisonous, like most of our Lizards. It is ra-

ther sluggish and creeps on the ground, I did not see it on trees. I refer it to the Genus *Stellio*, but with some doubt, perhaps it might form a S. G. *Lopherpes*, R. by its flat body with scales not imbricated, and cylindrical tail with scales imbricate and carinate. *Lopherpes* means reptile of the hills.

Stellio dicyanelis or *Lopherpes dicyanelis* Raf. Head brown above, white beneath with some black dots, two large blue spots on the sides of the throat, back cinereous, two rows of large brown spots on the sides, belly white, tail a little longer than body ringed of brown and cinereous.

Length of the head and body 3 inches, tail 4, total 7 inches. Head and body flattened with small equal scales not carinate nor imbricate. Tail cylindrical with imbricate carinate scales. Feet long with some white and black lines behind. C. S. R.

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107. *Twenty new genera of plants from the Oregon Mountains &c.*

By C. S. Rafinesque.

My friend Dr. John Torrey of New York is one of the best Botanists of our country; but he is so very cautious that he will not admit any improvement except after long delays and previous precedents. Thus he has hesitated to admit the natural method of Botany proposed by Adanson, Jussieu, and even Linneus 80 years ago, until the Linnean system was nearly given up in Europe, and discarded in England by Brown and Lindley within a few years. He employs the same caution with new G. and Sp. and hardly dares to propose any himself. Thus in his valuable account of the 491 plants collected in or near the Oregon mts. by Dr. James, published in 1827, he has described many plants in ambiguous terms as dubious or under wrong genera, because he was loath to frame N. G. for them. As I have long ago established the principle that every object of nature must be properly located and named in Botany and Zoology, I have been compelled to rectify this omission by forming many N. G. and N. Sp. out of his plants, for my florula Oregonensis. They are.

1. Epicostorus Raf. (meaning 20 on torus,) differ from *Spirea* and *Neillia*. Calix campanulate 5 lobed, petals none, stamens 20 inserted on a torus and nearly monadelphous at the base, pistil stipitate single, one style, one capitate stigma, capsul 3 seeded. *E. montanus* Raf. *Spirea monogyna* of Torrey sp. 119. his name implies a contradiction.

2. Psycrophila Raf. (a G. not S. G.) Dec. of *Caltha*, more like *Scotanum* Ad.) Sepals 9, stamens 25—30, pistils 12—15. *Ps. Sagittata*, or rather *Ps. auriculata* Raf. As I doubt whether the Oregon plant can be the same as that of Falkland Ids. *Caltha Sagittata* Dec. T. sp. 8.

3. Isopara Raf. *Cleomella* Dec. T. Sp. 24. inadmissible G. diminutive of *Cleome*. *I Mexicana* R.

4. Cubelium Raf. 1817. my previous and better name for the *Viola concolor* must prevail over *Solea* of Ging. T. sp. 26. there is besides a G. of fish *Solea*. Cubelium was an ancient name of a violet.

5. Dimenops Raf. The G. *Krameria* must form a family, and the anomalous sp. as many G. The *Ixina* has 4 sepals, the *Stemeiena* only 3 stamens. This G. sepals 5 unequal, petals 3 unequal, 2 lunulate, stamens 4 monadelphous at base. *D. lanceolata* R. Kr, do T. Sp. 33.

6. Vexibia Raf. *Patrinia* R. 1817 but there is another G. *Patrinia*. Calix tubulose, gibbose 4 dentate, vexillum bipartite, stam 10 nearly free, pod linear compressed poly sperm subtorulose. *V. Sericea* Raf *Sophora* do Nutal T. Sp. 65.

7. Acmispon Raf. (ng point hook-

ed) Differ from *Trigonella*, *Bucerates* and *Platycarpos*. Calix large deeply cleft, pod stipitate, straight compressed, swelled and hooked at the point. *A. sericeus* R. *Lotus do* P. *Trigonella Americana* N. T. Sp. 69.

8. Jamesia Raf. differs from *Psoralea*, calix not glandular, hairy, 5 subulate clefts nearly equal, stamens monadelphous, pod acuminate by style, stigma smooth. *J. obovata* Raf. *Psoralea jamessi* T. Sp. 75.

9. Orbexilum Raf. differs from *Psoralea*, calix campanulate not glandular, smooth, teeth ciliate, vexillum rounded expanded (stamens diadelphous.) *O. latifolia* Raf. Ps. do T. Sp. 76.

10. Physondra Raf. differ *Orobus*, *Phaca* and *Psoralea*. pod stipitate swelled membranaceous, 12 reniform seeds. 1 *Ph. longifolia*. 2. *Ph. dispar* R. *Orobus* N. T. *Psoralea* Pursh.

11. Dasiogyna Raf. differs *Prosopis*. Cal. camp. 4 dent. Petals 5 subequal. Stamens 10 free declinate subequal, (hypogynous!) Pistil stipitate villose, style filiform, stigma simple. Pod linear compressed bivalve torulose, pulpy within 12 seeded. *D. glandulosa* R. *Prosopis* T. Sp. 110.

12. Oreotrys Raf. Dif. *Tiarella* by 5 stamens only, from *Heuchera* by 2 styles, cal. camp. equal, capsul coalescent at base. *O. bracteata* R. *Tiarella* do T. J. 168.

13. Ornoxis Raf. Umbel. invol. o, partial 5—6 phyllous, linear. Flowers polyg. mixed. Calix 5 teeth subulate, petals 5 yellow equal acute, end incurved. Stamens and styles divaricate, pistil ovate sulcate, fruit tricostate on the back. *O. humilis* Raf. *Anonymos!* T. J. 179.

14. Ptiloria Raf. Dif. *Prenanthes* by pappus sessile, plumose, perianthe 5 flore 1 *Pt. pauciflora*. 2. *Pt. tenuifolia* R. *Prenanthes* do T. J.

15. Helioreos Raf. Dif. *Pectis*, Perianthe campanulate 8 phyllous, coriaceous. Rays 7 or 8 oblong entire yellow. Antheras mutic, style glandular, stigma bilobe. Seeds smooth 5 toothed. Phoranthe naked. *St. angustifolius* R. Pectis T. 228.

16. Batanthes Raf. (mg amiable flower) Dif. *Cantua*. Calix 5 gon. 5 fid. Corolla hypocrateriform 5 lobed entire. Stamens 5 unequal incluse. Style filiform, stigma trifid. Capsule 3 locular, 3 valve polyspermous seeds angular. 1 *B. agregata* 2 *B. longiflora* 3 *B. pungens* Raf. *Cantua* Sp. Pursh and Torrey.

17. Quincula Raf. Dif. *Physalis*. Corolla campanulate 5 lobed, with 5 opaque spots. Capsules 3 celled 3 seeded. *Q. lobata* R. *Physalis do* T. 302.

18. Leiostemon Raf. Dif. *Pentostemon*. Calix 5 leaved equal imbricate. Cor. bilabiate tubular, upper lip bilobe, lower trilobe. Stamens smooth, sterile filament smooth obtuse shrubby. *L. purpureum* R. *Pentostemon aubiguum* Torrey.

19. Ozodycus Raf. (mg fetid gourd) Monoical, perigone campanul. rugose, 5 external subulate teeth. Stamens 3 monadelphous singenesous stigmas 3 bipartite. Fruit globular smooth 4 celled, partitions spongy. Seeds on double rows oval smooth, margin acute. *O. perennis* Raf. *Cucumis* T. Sp. 396.

20. Fenelonia Raf. Perigone 6 sepals, 3 external trinerve, 3 internal narrower enerve. Stamens 6 equal, filaments linear narrow smooth anthers oblong. Pistil oblong obtusely triangular, style clavate subtriangular, stigma capitate trilobe. *Scape bracteate uniflore*. 1 *F. bracteata* Raf. *Ornithogalum* do T. 443. very different Genus.

I sent an account of many of those N. G. to Decandolle in 1830. I wish Torrey had saved me the trouble by forming and naming these N. G. himself or making S. G. of them; but now I hope he will not hesitate many years to adopt them.

He has done the same with 9 doubtful sp. throughout this otherwise clever labor; he has however several new ones, but not a single N. G. Ha-

ving forgotten the rules of Linneus *Philosophia Botanica* he has mentioned a *Vitis, Cleome, Dalia, Brachyris* without names nor descriptions, he has some N. Sp. with names but no descriptions, and described many anonymous N. Sp! These last I have named as follows.

Atriplex torreyana Raf. A. anon T. 379.

Aristolochia coriacea Raf. A. anon T. 394.

Sedum nuttalianum Raf. S. anon T. 171.

Silphium peristenium Raf. S. anon T. 239.

Iberis candicans Raf. T. anon. T. 17.

Polygala jamesi Raf. P. anon. T. 31.

Justicia dubia Raf. J. anon T. 354.

Anatherix ovata Raf. and *A. angustifolia* R. are both anonymous T. 261. 262.

Through over caution many distinct N. Sp. are made mere varieties, which I have thus rectified.

Verbena mollis Raf. *Var. of Stricta* T. 360.

Chenopodium simplex Raf. *Var. of hybridum* T. 373.

Stilingia salicifolia Raf. *Var. of sylvatica.* T. 404.

Vernonia marginata Raf. *Var of altiflima* T. 205.

Asclepias latifolia Raf. *Var. of obtusifolia* T. 252.

While the descriptions of some sp. evince that they are different from the sp. referred to, and thus real N. Sp.

Cercocarpus montanus Raf. *C. fothergillides* T.

Ammania auriculata Raf. *A. ramosior* T.

Gaura multicaulis Raf. *G. coccinea* T.

Rhodiola integrifolia Raf. or *Sedum rhodioloides* Raf. is *Rhodiola rosea* T. *or Sedum rhodiola.*

Lisianthus luteus R. *L. glaucifolius* T.

Hydrolea latifolia R. *H. spinosa* Torrey.

Blephilia hecki Raf. *monarda ciliata* T.

Chenopodium nigrun R. *Ch. maritimum* T.

Euphorbia missurica R. *E. portulacoides* T.

I must end these remarks by stating that the *Inula ericoides* T. is a *Diplogon. D. ericoides* Raf. and that the *Broussonetia tinctoria* is my *Toxylon* 1817. quite different from the *Morus tinctoria* of the West Indies.

Thus hesitation in science is often as injurious as haste. It is even better to have two names for an object than no name at all.

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108. *Account of* 32 *N. Sp. of plants from Florida.*

By C. S. Rafinesque.

The peninsula of Florida promises to enlarge greatly our Flora, 2000 sp. at least must be found there, of which 1000 may be either new or tropical, and 1000 common to the other Southern States. Bartram, Williams, and Ware have published short catalogues of some. It is said that the following Bahama plants grow there.

Cactus coronatus. C. nobilis. C. peruvianum.

Canella alba. Tamarindus indicus. Myrtus pimento.

Croton cascarilta. Cr. eleutheria.

With some sp. of the G. *Psychotria, Gardenia, Ficus, Guayacum, Cesalpinia,* &c.

Having seen in gardens and herbals several rare or new sp. of Florida, I will here describe some of them.

1. *Opuntia* (*Cactus*) *maritima* Raf Erect, articles obovate compressed, stellated dots with 2 kinds of spines, some long subulate stiff hairy at the base, some setaceous very small. Fruit obovate umbilicate, pulp crimson. On the sea shore from Florida to Carolina. Elliot blends this and the next as *Cactus opuntia.* Flowers yellow in all the sp.

2. *Opuntia* (*cactus*) *Bartami* Raf. Erect branched smooth, articles oval

spines few and short. Fruit pyriform purple, pulp scarlet acid—see my Flora Medica, vol. ii. page 247, and Bartram's travels.

3. *Opuntia spinalba* Raf. Erect, articles elliptic, spines fasciculate white curved uncial, base bristly. Fruit obcordate purple, seeds rugose. *C. opuntia* of Lunan, hort Jam. on the keys of Florida.

Besides these 3 erect sp. there are 3 procumbent ones known to me in the U. St. my *Cactus* or *opuntia humifusa*, descr. in Annals Nat. sp. 115 and 2 others, which I now add here, to complete our Opuntias. Decandolle had proved this an extensive genus already.

4. *Opuntia cespitosa* Raf. Cespitose, procumbent, articles oboval concave, spinules fasciculate minute rufous, barbed backwards, surrounding a long central spine. Fruits aggregate subpedunculate turbinate or oblong uncial spinulose, skin thick, pulp greenish, seeds. Large lenticular in Kentucky and Tennesee.

5. *Opuntia mesacaatha* Raf. procumbent, articles rounded; spinules fasciculate rufescent, central spine long brown. Fruits solitary oval, covered with spinulose thick scales. From West Kentucky to Louisiana.

6. *Malva Scandens* Raf. Pilose twining divaricate ramose, leaves 5 parted, flowers axillary solitary pedunc, segments of calix broad ovate, seeds hirsute. Mentioned by Bartram not described, cultiv. in his garden. Grows from Florida to Louisiana, flowers small greenish white.

7. *Malope lutea* Raf. 1817. *M. malacoides* of Walter, Elliot, Pursh, Nuttall! *Malva Americana* Wild and Muhl? Leaves ovate obtuse, dentate, smooth, nerves pubescent beneath, stipules lanceolate hairy, peduncles solitary axillary calix hairy petals yellow, fruit hispid globose depressed seeds compressed. Annual from Virginia to Florida. The *M. malacoides* of Europe which I have seen is quite different by leaves elliptical crenate base cordate, large purple flowers, fruit smooth spherical, seeds round.

8. *Sabbatia brevifolia* Raf. Stem dichotomous filiform, leaves short subulate acute, flowers terminal white, calix shorter than corolla setaceous, segments of corolla obovate. Near to *S. brachiata* and *Stellaris*.

9. *Brassica floridana* Raf. Stem simple erect terete, leaves petiolate oblong acute serrate, flowers paniculate.

10. *Lobelia microphylla* Raf. Stem simple smooth, leaves minute remote ovate sessile dentate, flowers terminal few and small. Florida and Louisiana.

11. *Lobelia nudicaulis* Raf. Radical leaves oblong or cuneate smooth stem angular naked with some remote setaceous scales, flowers terminal few remote. This is perhaps the *L. pallida* of Elliot but not ours of Muhlenberg.

12. *Helonias striata* Raf. Scape angular with setaceous scales, radical leaves slender striated longer than scape, raceme oblong lax, bracts membranaceous subulate short acute, sepals obovate acute.

13. *Commelina longifolia* Raf. Stem erect smooth, leaves divaricate very long linear lanceolate acute, spatha cordate plicate ciliate triflore flowers large.

14. *Œnothera cuneifolia* R. Stem ramose divaricate, leaves cuneate entire, branches uniflore, flowers large.

15. *Clitoria parviflora* R. twining folioles elliptical obtuse base subcordate, smooth, flowers solitary small.

16. *Erigeron lyratum* R. Radical leaves lyrate cuneate, scabrous with large teeth, stem striate villose, caulinar leaves adpressed cuneate remotely serrate, flowers corymbose small.

17. *Leptopoda floridana* R. Stem angular uniflore, radical leaves cuneate remote serrate acute smooth, caulinar leaves setaceous adpressed peduncles thicker above, rays yellow and short.

18. *Rudbeckia angulata* R. Stem with acute angles, uniflore, leaves adpressed hirsute oblong acute entire, the lower ones opposite, perianthe hirsute, segments linear obtuse.

19. *Silphium reticulatum* Raf. Stemless, radical leaves oblong lyrate lobate obtuse smooth, scape rough uniflore, perianthe ample, segments round reticulate venose.

20. *Vaccinium glaucum* R. Leaves ovate oblong entire, nearly obtuse, glaucous beneath, peduncles axillary 1 to 3 flore, flowers small campanulate, stamens exserted.

21. *Osmodium nigrum* R. Leaves cuneate oblong acuminate entire strigose fuscate. They become black when dry, near to *O molle*.

22. *Typha spiralis* Raf. Leaves spirally contorted, ensiform and vaginate at the base, end flat thick obtuse, spikes annexed each with a spatha. This is the *T. latifolia* of Cuba, and the Jamaica authors.

23. *Sisyrinchium teres* Raf. Stem round, hardly biangular above, leaves narrow striate, flowers subpaniculate ample, spatha bivalve subequal membranaceous acute 2-3 flore, sepals submucronate. Florida and Louisiana.

23. *Calipogon parviflorum* Raf. Root bulbose, stem one leaved 3—5 flore, leaf long, linear striate, flowers spicate, minute, bracts subulate, labellum undulate. Fl. and Louis.

25. *Tradescantia divaricata* R. Leaves remote divaricate oblong lanceolate, base spathiform, umbel multiflore, spathas 2 subequal lanceolate divaricate, calix smooth.

26. *Tradescantia graminifolia* R. Stem slender, leaves graminiform erect, flat, striate, umbel pauciflore uneven, spatha of many short obtuse scales, calix smooth.

27. *Stachys revoluta* R. Leaves linear sessile obtuse canescent, margin revolute, whorls 6 flore, flowers subsessile, calix striate hispid subbilabiate. Fl. and Louisiana.

28. *Stachys sessiliflora* R. Leaves oblong cordate serrate acute smooth, whorls few pauciflore, flowers sessile.

29. *Drosera uniflora* R. Leaves shortly petiolate spathulate glandular all over, scape uniflore, base leafy.

30. *Drosera sessilifolia* R. Leaves cuneate sessile, scape pauciflore pilose, flowers racemose large petals cuneate.

31. *Avicennia floridana* R. Shrubby, leaves perennial oblong acute, tomentose beneath flowers in sessile clusters. In Fl. Louis. and Jamaica, the *A. tomentosa* of Nuttal and Brown but the Asiatic sp. is a large tree with paniculate flowers.

32. *Lantana floridana* R. Branches square scabrous, leaves rugose rough, ovate lanceolate, crenate serrate, veins pubescent, petiols short, bracts subulate, capitule crowded, peduncles clavate. *L. camara* of Bart. Elliot and all our authors but different: flowers versicolor, yellow, orange, red, crimson or scarlet on same shrub, berries globular, blue, small.

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109. ON 3 SP. OF TYPHA.

The *Typha latifolia* was said to grow from China to America, but whenever closely described by botanists, their descriptions evince different sp. blended under that name. Those of N. and S. Europe, India, China, Africa, S. and N. America are all distinct.

We have even several sp. in N. America, the *T. spiralis* of the W. Indies and Florida was mentioned in the last essay, I now shall add two others from the South and the North.

1. *T. elatior* Raf. Stem gigantic, leaves shorter one inch broad flat, base vaginate, end acute, upper spike separate cylindric without spatha, stamens monadelphous at the base. From Carolina to Kentucky, a large Sp. from 6 to 10 feet high: the stem is round, solid and smooth as usual. It is the *T. latifolia* of Elliott and the Southern botanists.

2. *T. crassa* Raf. Stem humble,

foliose leaves as high, flat convex beneath at the base not vaginate, end obtuse. Spikes united and thick, upper subequal, between them a caducous bract ovate lanceolate membranaceous. Maryland to New York and Canada. *T. latifolia* of the Northern botanists. Stem only 3 or 4 feet high spikes 4 to 6 inches long, one inch thick, lower spike brown very dense and thick.

These 3 sp. are very distinct. Another sp. grows in Oregon.

C. S. R.

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110. Two New Genera of Umbelliferous Plants from Kentucky.

These two singular plants were discovered in 1822, one *Orimaria* is near to *Buplevrum* having entire leaves, the other *Streblanthus* is near *Eryngium* having opposite leaves and capitate flowers.

1, Orimaria. Pistil oblong, seeds linear smooth black, angular behind. Calix entire. Petals 5 white minute base with a foveole or small round pit, end retuse involute, tip adnate inside. Stamens 5 small anthers subsessile round. Stigma 2 sessile small. General Involucre triphyllous subulate, partial 5 phyllous, folioles equal elliptic acuminate scariose trinerve. *Annual herbs smooth dichotomous, leaves alternate sessile entire linear.*

Orimaria filiformis. Raf. Stem filiform flexuose, dichotomely branched, leaves remote linear—filiform, acute, lower nearer with broader retuse tip. Umbels terminal 3-4fid, umbellule 3-6flore, peduncles unequal, shorter than involucres.

In the barrens or glades of West Kentucky, rare, vernal. Stem 4 to 8 inches. Habit of a grass. Flowers white minute hidden in the involucre. Different from *Buplevrum* by the petals and seeds, the foveole of the petals has suggested the generic name.

2. Streblanthus. Flowers monoical in separate heads. Involucre 4-5 phyllous, folioles linear unequal, phoranthe cylindrical naked. M. fl. in ovate heads, calix 4 fid, pistil adherent abortive. Petals none. Stamens 4 subsessile very small. F. fl. in oblong heads, calix 4 toothed persistent, pistil obovate punctate. Petals none. Styles 2 filiform persistent, stigmas capitate. Fruit bipartible, crowned, 2 seeds convex scrobiculate behind. *Annual herbs prostrate, leaves opposite simple heads axillary.*

Streblanthus auriculatus Raf. Smooth prostrate, stems filiform flexuose, leaves opposite subsessile, lower petiolate, ovate lanceolate, base with 1 or 2 auricles, end acute, heads axillary solitary pedunculate.

A striking N. G. of the group of Eryngides by its monoical apetalous tetrandrous flowers. The *Er. cervantesi* of Mexico, *Er. tenue* of Carolina and *Er. floridanum* of Torrey's herbarium come nearer to it and perhaps belong to this G. Found in the glades of W. Kentucky. Estival, heads somewhat bluish. Stems a foot long, leaves entire or with some notches, auricles unequal when 2. *Streblanthus* means deceitful flowers, since they resemble *Eclipta, Scabiosa* and many Rubiacea.

C. S. Rafinesque.

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111. On 12 N. Sp. of Plants from Illinois, &c.

By C. S. Rafinesque.

They were chiefly discovered in 1818, or given me since by Dr. Muller and Dr. Ward.

1. *Collinsia purpurea* Raf. 1818. Stems simple pauciflore, leaves remote, lower obovate, upper linear acute, peduncles equal to flower, calix campanulate, corolla purple, upper lip short....Annular and vernal like the *C. bicolor* or *verna*, on the bank of the Wabash, only 3 to 4 inches high.

2. *Plantago gonophylla* Raf. 1818 Smooth stemless, leaves petiolate ovate oblong acute, margin unequally angular, 7 nerved. Scape round spike slender elongate, flowers scattered lax ovate globose, bracts and

segments of calix ovate obtuse concave, segments of corolla ovate acute....Perennial estival, scape 1 or 2 feet, Illinois and Ohio.

3. *Plantago atrofusca* Raf. 1823. Stemless, leaves sessile lanceolate acute entire 5 nerved, subpubescent base hirsute. Scapes flexuose filiform pubescent, angular above, spike ovate dense blackish smooth. bracts imbricate broad ovate acuminate.... Perennial, estival, in arid hills of S. Illinois and W. Kentucky, leaves 1 or 2 inches, scapes 3 to 6.

4. *Veronica connata* Raf. 1818. Erect smooth, stem round fistular, leaves connate lanceolate acute entire, racemes axillary divaricate very long, lax, bracts linear, pedicels double of bracts, capsules bilobe compressed....Annual, vernal, flowers blue, near to *V. Scutellata* and *V. uliginosa*, but larger, leaves quite united and perforated by the stem. In W. Kenty. Missouri and Illinois.

5. *Tradescantia rupestris* Raf. 1819. Stem simple smooth, leaves longer slender narrow canaliculate smooth, umbel multiflore, spathas divaricate very long like leaves, peduncles pilose recurved, calix pilose behind....Vernal flowers pale blue, on the cliffs and rocks of the Wabash, Kentucky, &c. 15 to 20 inches high, leaves a foot long.

6. *Tradescantia brevicaulis* Raf. 1818. Stem simple very short, flexuose, leaves much longer, narrow, nearly flat, carinate striate, base vaginate tubular membranaceous ciliate: umbel pauciflore, bracts equal to leaves, peduncles and calix very pilose...Vernal fl. blue small, a small sp. stem only 3 to 6 inches. Illinois and Kentucky.

7. *Tradescantia flexuosa* Raf. 1820. Stem ramose flexuose, sulcate leaves broader lanceolate, flat pubescent, pale beneath: umbels axillary subsessile, bracts lanceolate short, peduncles and calix villose....Estival flower deep blue. Stem 2 or 3 feet high nearly zigzag, leaves one inch broad. Akin to *Tr. Subaspera* but very distinct. In Kentucky and Missouri.

8. *Tradescantia canaliculata* Raf. Entirely smooth, stem simple slender, leaves subequal, slender narrow canaliculate falcate, base tubular vaginate; umbel terminal pauciflore, bracts short flat, one very minute, peduncles smooth nodding, calix smooth...Estival, in Kentucky a foot high- These and the 2 Tr. of Florida make 6 N. Sp, of this fine G. which has lately been increased from 2 to 12 Sp. from the U. S.

9. *Orchis glareosa* Raf. 1818. Stem round slender, leaves narrow lanceolate adpressed, spike short oblong, bracts lanceolate longer than flowers, spur filiform equal to the germ, labellum concave trilobe, middle lobe retuse....Estival flowers greenish yellow, in the glades of Illinois and W. Kentucky, one foot high, near to *O. fuscata* and *O. herbiola*. Probably *Habenaria glaresa* Raf.

10. *Helichroa fuscata* Raf. 1818. Rough, stem angular pauciflore, lower leaves long petiolate ovate acute 5 nerved subdentate, upper leaves subsessile lanceolate, segments of perianthe reflexed rays cuspidate....Glades of the Wabash. Estival flowers of a brown purple, 3 inches diameter, rays narrow, stem 1 to 3 feet high. My G. *Helichroa* 1825 is based on the *Rudbeckias* akin to *R. purpurea*.

11, *Helichroa crocea* Raf. 1818. Hirsute, stem angular uniflore, naked above, leaves all sessile lanceolate, base rounded, end gradually acuminate, outer segments of the perianthe lanceolate reflexed.... Glades of Wabash, 1 or 2 feet high. Estival flowers of saffron color.

12. *Prenantus spicata* Raf. 1818. Stem angular rough above, nearly simple, leaves undivided smooth oval lanceolate, flowers spicate scattered, bracts linear acute hirsute, perianthe multiflore 8-12 phyllous, segments linear obtuse hirsute in the

middle, calicule hirsute lanceolate acute....Glades Illinois and Ohio, 2 feet high, estival fl. ochroleucous, seeds compressed oboval pappus fulvous. Near to *Pr. racemosa*, but flowers sessile.

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112. On 17 N. Sp. of Plants from Upper Canada, &c. by C. S. Rafinesque.

They are chiefly from the islands of the St. Lawrence, near Lake Ontario, seen in the herbal of Mr. Harokins in 1816, or collected near Lake Erie and Niagara falls in 1826.

1. *Cornus cyananthus* Raf. 1816. Stem herbaceous angular, leaves 6 whorled sessile obovate acuminate, sulcate above, glaucous beneath, flowers blue capitate subcymose naked pedunculate, berries oblong...A beautiful striking sp. near to *C. canadensis*, same size, but flowers blue with a long style: very rare.

2. *Cornus suffruticosus* Raf. Stem humble shrubby, leaves petiolate ovate, base acute, end obtusely acuminate, margin cartilaginous, above hispidule, beneath smooth glaucous, cymes pedunculate. A small shrub 12 to 20 inches high, with red twigs, small leaves, white flowers estival. From Lake Champlain to Lake Erie in Ohio.

3. *Pyrola flexuosa* Raf. 1816. Stemless, radical leaves on long petioles, elliptical, both ends subacute, remotely denticulate, scape flexuose raceme oblong dense....Is it a variety of *P. dentata*?

4. *Sigillaria ciliata* Raf. 1816. Stem terete flexuose leaves clasping smooth ovate oblong acuminate, margin ciliate glaucous beneath peduncles uniflore, berries red....Very different from the *Convallaria ciliata* of authors which is not a *Sigillaria* or *Axillaria*, but a *Mayanthus* or *Racemaria*.

5. *Lathyrus incurvus* Raf. Folioles 8 ovate or obovate acute smooth veins longitudinal, racemes axillary multiflore incurved, peduncles curved....On Lakes Erie and Ontario, flowers blue small.

6. *Lysimachia* (*Tridynia*) *sessilifolia* Raf. Leaves opposite sessile ovate lanceolate obtuse, punctate, pale beneath, flowers opposite or whorled, peduncles short, petals entire....Near to *L. revoluta*. Flowers yellow with 5 unequal monadelphous stamens as in S. G. or G. *Tridynia*.

7. *Thalictrum pauciflorum* Raf. Dioical, leaves biternate, folioles ovate acute entire smooth, pale beneath, terminal petiolate subcordate trifid, panicle terminal pauciflore, filaments filiform...Near to *Th. dioicum*, but different, stem 15 to 18 inches flowers white estival. On L. Ontario, &c.

8. *Arenaria flexuosa* Raf. Stem flexuose subramose erect, 2-4 flore, leaves ovate oblong acute trinerve pubescent, flowers terminal, peduncles long, segments of calix ovate obtuse, shorter than petals....In islands, small fl. white, very different from *A. lateriflora*.

9. *Arenaria connata* Raf. Stem erect simple slender biflore, leaves connate cuneate oblong pubescent acute, flowers apetalous, cal. segments lanceolate....The apetalous sp. of this G. must form a S. G. *Monilix*.

10. *Orchis* (*Platanthera*) *rotundifolia* Raf. 1816. Two opposite leaves orbicular emarginate multinerve, very smooth lucid, flowers racemose lax, bracts oblong lanceolate longer than peduncles, germ angular clavate curved reflexed, spur filiform longer than germ, petals broad ovate, labellum filiform obtuse....Fine sp. stem 18 inches, flowers white. It appears different both from *O. macrophylla* and *Orbiculata* (nearer the last) by the racemose flowers, &c. Leaves in all large nearly radical.

11. *Caprifolum dentatum* Raf. Leaves connate oblong acute remotely toothed, glaucous beneath, last pair united in a campanulate biacute form, flowers sessile ternate, berries red....Near *C. flavum*.

12. *Sium rugosum* Raf. Five

pairs of folioles, lanceolate, elongate, pectinate—serrate unequaly, acute, rugose! Involucres unequal pinnatifid, partial simple linear....Fl. white estival, poisonous, see my Med. Fl. vol. 2 p. 262. On the Lakes from New York to Ohio.

13. *Asclepias rotundifolia* Raf. Stem simple, leaves opposite petiolate rounded or obovate obtuse smooth, glaucous beneath....Very different from *A. obovata* by smooth glaucous leaves.

14. *Asclepias dasypus* Raf. Stem simple, leaves opposite, subsessile elliptical acuminate undulate, villose beneath....Is it a variety of *A. purpurascem?*

15. *Fragaria serotina* Raf. Stemless, dwarf, leaves radical subsessile, pilose, folioles rounded crenate scapes uniflore, fruits depressed autumnal....Singular Sp. producing fl. and fruits only in Sept. or October.

16. *Fragaria elatior* Raf. Stem erect bipedal, leaves smooth, folioles petiolate ovate oblong, base entire, glaucous beneath, fruits oblong uncial...This and the last are as different sp. as can be, my varieties of strawberries in Med. Fl. vol. 1. are probably as many sp. likewise.

17. *Viola eriocarpa* Raf. Caulescent, leaves broad deltoid, obtusely crenate, nerves pubescent, stipules lanceolate entire, flowers geminate subsessile, capsules wooly white.

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113. Vernasolis a New Genus by C. S. Rafinesque.

I discovered in 1823 a fine N. G of Vernal radiate plants near to *Gallardia*, in the barrens or glades of West Kentucky and W. Tennessee, and not less than 3 sp. of it. Such vernal plants being rare I named the G. Vernal Sun.

Vernasolis. Perianthe triple, each 6-10 parted, segments oblong obtuse, outer smaller uncolored, medial with colored margin, inner colored. Phoranthe flat, polygamous superflous, chaff linear membranaceous entire. Rays 6 to 12 sterile spatulate end unequaly 5 lobed. Floscules of disk many, tube short limb campanulate membranaceous 5 fid. stamens subequal brown. Style included, 2 thick glandular oblong stigmas. Some sterile flosc. mixt. Seeds oblong compressed black, crowned by an umbilicate margin and 2 membranaceous scales. *Roots creeping perennial, flowers yellow vernal on long uniflore peduncles.*

1. *V. glauca* Raf. Stem erect sulcate pauciflore, base hirsute, leaves alternate entire obtuse ciliate glaucous smooth, lower petiolate obovate rounded, upper sessile obovate oblong....Small plant less than a foot high, with some varieties 1. *Pauciflora*, 2. *Subopposititolia*.

2. *V. auriculata* Raf. Stemless, creeping, radical leaves petiolate obovate with 1 or 2 auricles, obtuse, smooth, glaucous beneath, scapes elongate uniflore terete.

3. *V. heterophylla* Raf. Caulescent subcreeping, radical leaves petiolate cuneate obovate, obtuse entire. Stem striate hirsute 2-3 flore, caulinar leaves opposite, subsessile subdentate, subhirsute, trilobate, lateral lobes oblong smaller, medial obovate.

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114. Lophactis N. G. by C. S. Rafinesque.

I noticed in 1818 this plant on the Wabash, but out of blossom, in 1821. Dr. Ward brought me a perfect specimen from White R. Indiana. It is also a N. G. of radiate plant near the *Vernasolis*, *Leptopoda* and *Balduinia*. The name means crested rays.

Lophactis. Perianthe double, each 8 phyllous, segments ovate obtuse, outer spreading smaller, inner larger erect. Polygamy necessary. Phoranthe convex, chaff filiform. Rays 8 cuneate, end broad crested or unequaly 5 lobed. Style very short. Seeds oblong crowned by 5 to 8 scales elongate, cristate on the back. Floscules of the disk male tubulose 5 toothed.

L. uniflora Raf. Smooth, stem erect uniflore striate, leaves oppo-

site cuneate lanceolate remote obtuse entire rugose, lower petiolate, upper sessile....Stem 12 or 15 inches high, flower estival, rays yellow, disk purplish black.

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115. On 4 N. Sp. of North American Tulips by C. S. R.

I have the pleasure to introduce this fine G. into our Flora, by noticing four N. Sp. of it; but Pursh had already one, which he wrongly united to Lilium or Lily.

1. *Tulipa bicolor* Raf. Stem flexuose uniflore leaves flat oval lanceolate acuminate subundulate glaucous flowers erect, petals shortly acuminate the outer ovate, the inner obovate....Native of Arkanzas, in my herbarium; seen alive in a garden of Kentucky in 1821. Stem one foot high, flowers half the size of common tulips, white but lilac color outside.

2. *Tulipa aurea* Raf. Stem slender streight uniflore, leaves radical and caulinar slender graminiform, canaliculate, end falcate; flower erect, petals yellow acuminate outer lanceolate, inner ovate....Seen in gardens, native place unknown, perhaps not American. Stem less than a foot, flowers of a golden yellow, smaller than the last.

3. *Tulipa montana* Raf. Stem uniflore one leaved, radical leaves equal to stem, elongate narrow flat acute, stem leaf short vaginate, flower erect, petals lanceolate acute orange color, stamens equal in length ....I have not seen this sp. but I describe it from a drawing of Audubon, who discovered it in May 1809, in the Alleghany mountains. Over a foot high, flower as large as the garden tulip.

4. *Tulipa pudica* Raf. (*Ambliri-on pudicum* Raf. 1816.) *Lilium pudicum* Pursh. Stem uniflore curved above, leaves lanceolate linear acute, flower pendulous petals obovate spatulate very obtuse, yellow....Evidently a tulip by the habit and lacking the groove on the petals forming the G. Lilium....If it has a style it will form a S. G. *Amblirion* or peculiar G. between *Tulipa* and *Fritillaria*. From the Oregon country.

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116. New Plants of the Alleghany Mts. By C. S. Rafinesque.

Among 30 rare plants collected this year in the Alleghanies of Maryland and Pennsylvania one appears to me a N. G. and half a dozen are N. Sp. which I shall concisely designate.

N. G. Ochronelis. Perianthe polyphyllous in a double series. Phoranthe flat. Chaff membranaceous subtridentate, lateral teeth 1 or 2 unequal. Rays 12 to 15 narrow entire. seeds compressed bidentate, teeth unqual membranaceous. This G. has the perianthe of *Rudbeckia*, and the remainder as some sp. of *Helianthus*, but the rays as in *Dianisteris* (*H. aristatus*) which has phoranthe hemispherical &c. The name means pale Sun.

1. *O. sulfurea* Raf. Stem erect smooth striated, leaves opposite or ternate, upper alternate, all sessile lanceolate rough, base acute, end acuminate, margin subserrate; flowers terminal, perianthe segments linear lanceolate ciliate....In meadows of mts. Stem 3 to 6 feet high, flowers very pale yellow. Several Var. 1. *Uniflora*. 2. *Pauciflora*. 3. *Multiflora*. 4. *Ternifolia*, &c. Probably a *Helianthus* of authors, which?

2. *Sanguisorba palustris* Raf. Stem virgate, folioles petiolate unequal elliptic, pectinate serrate, base cordate, very smooth, lower leaves on long petioles, upper leaves subsessile, spikes on long peduncles, cylindrical, bracts subulate, stamens filiform clavate exserted....In a single swamp in the mts. of Pens. 3 or 4 feet high, entirely smooth, flowers white in a spike 3 to 5 inches long.

3. *Impatiens montana* Raf. Stem flexuose very branched, leaves small ovate oblong, acute at both ends, mucronate, remotely mucronately serrate, peduncles solitary 2-4 flore, galea longer than the petals, spur resupinate short....In rocky streams of the mts. stem 2 or 3 feet high,

leaves and flowers small, fl. saffron color with few red spots: distinct from *I. fulva*.

4. *Erysimum angustifolium* Raf. Roughish, pubescent, glaucescent, leaves linear oblong, base attenuate, end acute, very entire, racemes naked, siliques linear compressed, style persistent....Probably the *E. cheiranthoides* of Pursh, Nuttal &c. quite different from the European ditto which has large lanceolate dentate leaves. Found in Maryland, annual, stem 3 to 6 inches, flowers small yellow.

5. *Gerardia rupestris* Raf. Very smooth, stem purplish fistulose, leaves sessile bipinnatifid, segments deep remote acute, sinusses rounded upper leaves oblong pectinate, bracts lanceolate entire, racemes often ramose, secundiflore, peduncles short calix 5 fid....Fine Sp. near *G. glauca*, probably the real *Rhinanthus Virginicus* of L. Stem 2 or 3 feet high, flowers yellow rather small. On the rocks of the Alleghanies and Tuscarora mts.

6. *Verbena incarnata* Raf. Stem branched, leaves ovate lanceolate serrate rough, flowers in simple slender short spikes....On the Juniata R. one foot high, flowers flesh colored, differs from V. urticifolia by narrow leaves, spikes not paniculate, nor flowers white.

7. *Arenaria sperguloides* Raf. Stem procumbent diffuse very ramose leaves filiform setaceous in opposite fascicles smooth, flowers in naked panicles, calix acute ...Akin to *A. glabra* and *stricta*, but not erect and leaves like those of asparagus. On a single rock in Pennsylvania.

8. *Glycine montana* Raf. Stem suberect flexuose angular pilose backwards, leaves ternate, folioles oval acute, lateral ones oblique or suboordate at the base, stipules subulate, flowers solitary subsessile, pods oblong flat pendulous 2-3 seeded, seeds lenticular....On the top of the Alleghanies, annual, habit of *Amphicarpa*, but calix acute at base, pod sessile although attenuated at base, as in *Glycine*.

117. CONCHOLOGY. TWO NEW BIVALVE. FLUVIATILE SHELLS OF S. AMERICA, BY C. S. RAFINESQUE.

These two fine shells are from the Cabinet of Professor Green, who permitted me to draw them and describe last March. They are both from the R. Parana above Buenos Ayres.

1. *Anodonta aperta* Raf. Oval elliptical much swelled, broader behind and slanting, very smooth and dark brown outside, quite gaping below, iridescent white inside. Length and diameter ½ of breadth, axis at ¼. ...Fine large sp. 6 inches broad, shell rather thick, beaks prominent, not gaping at the ends but below; hinge streight slanting ending in 2 small angles, no wrinkles on it, but slightly flexuolate beneath.

2. *Unio paphos* Raf. Oval, flexuose and subtruncate behind, with an obliqual ridge from the beak, brown outside with many minute concentric strias, inside purplish white. Length 2-3, diameter 7-18, axis at 1-3 of the breadth....Pretty Sp. 2 inches broad, shell rather thin for Unios, lamellar tooth slightly curved, cardinal tooth sub-bilobe crenate. Beaks not prominent.

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118. ODATELIA N. G. *of N. American Bivalve fluviatile shell. by C.S.Rafinesque.*

One of our Ohio shells, which has been put with the *Unios* or *Anodonta* by different writers; it was unknown to me till I observed it in Prof. Green's cabinet, and I immediately ascertained that it must form a N. G. or group between *Anodonta* and *Sulcularia*. I call it *Odatelia* meaning imperfect teeth.

ODATELIA Raf. Cardinal tooth imperfect like a callosity, with a large desinense as in *Alasmodon*, becoming an imperfect lamellar tooth angular as in *Lasmigona*.... This G. must belong to the series of *Anodonta*, but forms the passage with *Alasmodon*. How Say and Lea could put it with *Unio!* is rather strange.

Odatelia radiata Raf. Elliptical flattened elongate, broader behind with subtruncate end, outside olivaceous brown, with black rays, inside bluish iridescent. Length 1-3, diameter 2-9, axis at 2-9 of the length.

Unio Oriens. Lea.
Unio dehiscens. Say.
Anodonta prelonga. Green.

Breadth over 2 inches, shell rather thin both ends rounded and brown.

5

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VOL. I. PHILADELPHIA, SPRING OF 1833. No. 5.

119. AMERICAN TRAVELLERS.

Who have written their travels? The Americans are great travellers at home and abroad for pleasure, health, or business, as settlers, traders, surveyors, agents, missionaries, navigators, adventurers, &c.; but few are qualified to write their observations, fewer still write them.

I have sent to the society of Geography of Paris, a long critical account of all these last from 1820 to 1832, dividing them into 6 series. In general travels at home or in N. America are the best, abroad the Americans are supercicial, ignorant of languages, and deficient in high acquirements. I give here an abridgement of it.

First Series. Travellers in North America.

Astley, 1824. Upper Missouri and New Mexico.

Atwater, 1831. To N. West.

Audubon, 1831. Florida, &c.

Catlin, 1832. On Missouri to Mandans.

Darby, 1820. From New-York to Detroit.

Dunn, 1826. Guatimala.

Dwight, 1828. Northern States and Canada.

Flint, 1826. Western States.

Hall, 1828. Ditto.

Hunter, 1823. Among Western Indians.

James & Long, 1823. Missouri, Oregon and Arkansas.

Keating, 1824. To N. West.

Mackenny, 1827. Lake Superior.

Morse, 1822. Among Indian tribes.

Nuttall, 1821. Arkansas.

Poinsett, 1822. Mexico.

Rafinesque, 1818 to 1830. Fragments of his travels in 18 States—1831. The Mexicans in 1830.

Schoolcraft, 1821. Mississippi—1823. Illinois, &c.

Silliman, 1820. Canada,—Many excursions in his Journal.

Smith, (Jed) 1827. New Mexico.

Stanbury, 1822. Gr. Lakes.

Tanner, 1830. Residence among N. W. Indians.

Thomas, 1820. To Wabash.

Williams, 1827. Florida.

Many other travellers have not yet published their observations, such as Gates, Wyeth, Ware, Cozens, Peale, Mease, &c. or only in Journals, Gazetteers, Maps, &c. Foreign travellers and tourists in N. America are not included here, they are mostly worthless, except Weymar, Beltrami, Coxe, Franklin, Bradbury, and a few others.

Second Series. In South America. Few.

Abbott, 1827. Cuba.

Breckenridge, 1820. Buenos Ayres.

Duane, 1826. Columbia.

Officer, anonymous, 1827. Columbia.

Others will perhaps publish their travels. Eights in Patagonia. Peale, Columbia. Reynolds in Chili, &c.

Third Series. In the Austral and Pacific Ocean.

Anonymous Sketches of a Mariner, 1830.

Morrell, 1832. Four Voyages. I have analyzed his discoveries.

Paulding, 1831. To Mulgrave Islands.

Porter, 1822. Cruise. 2d ed.

Stewart, 1827. Havay.—1831. Pacific.

Fanning has promised his Voyages for 1833.

Fourth Series. In Asia.

Mrs. Judson, 1827. Asia: the first American Lady who has written her travels.

Waln, 1823. Hist. of China.

White, 1826. Cochinchina.

Wood, 1831. Sketch of China.

Dr. Burroughs to Aslam, Mpt. seen by me.

Fifth Series. In Africa.

English, 1823. Nubia.

Ledyard, 1824. Life & travels.

Morrell, 1828–29. South Africa, his third Voyage.

Noah, 1821. Barbary.

Riley, 1824. 2d ed. of Shipwreck.

Shaler, 1826. Algiers.

Ashmun & others have published fragments on Liberia.

Sixth and last Series, In Europe. Many tourists on the English plan, not worth mentioning, full of blunders. Lyman in Italy, Carter in France and Italy, are such; they knew not the language of the country! What should we think of an Italian or Russian, writing his travels here without speaking the English. In general tourists are only at home in England. Among the crowd the following may be distinguished for some merit, novelty or talents.

Alden, 1832. Practical tourist.

Anderson, 1831. Greece.

Bigelow, 1830. Sicily and Malta.

Dwight, 1829. Germany.

Griscom, 1821. Europe.

Jones, 1829. Mediterranean.

Webster, 1821. Azores.

Wines, 1832. Mediterranean.

Woodruff, 1830. Malta and Greece.

Young American, 1828. Spain.

Willis is now writing vapid Letters from Europe,

Dekay promises a Voyage to Turkey, but he spoke neither Greek nor Turkish, as usual.

The dates are those of publication. C. S. R.

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120. *Reward of Merit.*

The beautiful gold Medal awarded to Prof. Rafinesque, by the Geographical Society of Paris, has been received with a Diploma of Merit. It bears on one side the head of Minerva and on the other a suitable inscription.

This Society is composed of the most eminent and learned men of France. They have decided that the question of the origin of mankind, and the black nations is as yet insoluble, owing to our imperfect knowledge of many languages; but they have approved and rewarded the memoirs and labors of the writer, as one step towards such a solution, by connecting the languages and traditions of all the nations of the world with the primitive cradle of mankind, Asia and the Imalaya.

It is believed that this is the first instance of such an honor being awarded to any American citizen, by one of the most eminent learned Societies; for a labor at least of erudition in the highest branches of historical knowledge, philology and ethnography.

But this kind of merit and lofty knowledge is so little understood and valued here, that some periodicals have refused even to notice this literary fact!

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121. Alleghanies Mountains.

Physical geography is much neglected in the U. States; lakes and streams must be surveyed and laid out in maps, but table lands mountains and hills are often altogether omitted or incorrectly delineated. Our first Surveyors began their surveys in the level atlantic region, when they came to the hills and mountains they commenly servеyed them by running lines near them, reducing all elevations to flat acres of aerial surface instead of terrestrial surface, thus three acres in mountains are often 4 or 5 in reality. From these erroneous surveys our maps are made. In some maps lofty mountains are not even laid out; thus the Catskill mountains 4000 feet high, are not found in many maps of N. York. Tablelands and hills were altogether neglected. Thus we had no correct delineation of our soil, slopes and elevations of land.

When mountains were introduced in maps, they were put down at random, at first in heaps, laterly in ridges. Thus was formed the opinion that all our mountains were in parallel ridges. Yet nothing is more erroneous: Since nearly all our mountains are in fact Table-lands or Plateaux, rising by successive steps or in some instances abruptly, with some ridges and

peaks in various places, or in chains or groups.

Valleys are also neglected, and it is not shewn whether streams run in plains, basins, ancient lakes, narrow valleys or gullies. As early as 70 years ago, Hutchins surveyed the river Ohio and noticed some features of the valley where it flows; but later geographers have not even attended to his map, trusting to new *flat surveys*. In 1818 I surveyed again topographically that valley with all its hills, gaps, bluffs, lakes, &c. for Cramer and Spear of Pittsburg, who paid me $100 for this labor; but have since resold it to somebody else, and it has not yet appeared in our general maps.

Mr. Tanner, desirous to improve his great map of the U. States, purchased from me last year, my surveys of mountains, spurs, hills, knobs and tablelands, chiefly in the States of Kentucky, Indiana, Ohio, N. York and Pennsylvania. He has inserted them in his map of 1832, which if compared with the former map of 1830, will evince a vast difference in physical geography. He has also inserted the tablelands and mountains of Tennessee, from the late map of Rhea. And quite lately the Gold Mines Region has called forth a new map of Peck, (in Silliman's Journal) which delineates the South East slopes of our mts.

We have then now something like a correct outline of the contour of our Alleghany mountains, formerly called Talegawi, except in the S. & S. W. I was the first to trace their contour or limits to the North, N. W. and West. Darby and Thomas had long ago spoken of the N. W. end of the Alleghanies near lake Erie, 2000 feet high, but as late as 1832 they were not in our maps! yet they are there as in N. E. an abrupt rise of the Aleghany tableland, 360 miles wide from lake Erie to the Catskill, and quite connected in the North; as the rise of the Delaware, Susquehannah, Ohio and Genessee streams ought to have indicated. Through N. York this tableland sends many hilly spurs between the minor lakes, and has a broad apron or tableland step forming the falls of Niagara and Genessee; while at the falls of the Mohawk a spur runs out to join the Canadian and Primitive mts of the North. At the N.E. end they are called Kiskanon or Catskill mountains, and rise abruptly 4000 feet.

The Mattawan mountains vulgarly called Highlands are primitive, and form a narrow broken tableland, cut up by the Hudson river, and tide-water, with peaks of 1500 feet; they run W. and E. and soon after become the Taconic mts. running from S. to N. between the Hudson and Connecticut basins, to become further off the Green mts of Vermont and the White mts of New Hampshire and Maine, 7000 feet high, the highest of our mountains, and the primitive

nucleus of all the New England mountains and hills.

But leaving these Northern mountains to return to the Alleghanies proper, we find them forming a broad tableland in North Pennsylvania, which gradually becomes broken into ridges by the valleys and streams. But the main or middle branch dividing the Eastern and Western Waters, called the Backbone mountain is yet a broad tableland in center county, and gradually tapers to 20 and 10 miles breadth at the Pittsburg and Cumberland roads; although our maps represent it as a mere ridge, I pointed out this error to Mr. Tanner, but it could not be conveniently corrected in his map, and thus is there yet!

The Delaware, Susquehannah, Juniata, and Potomac rivers rise in this tableland and break through these ridges in many places, forming many successive watergaps, which were ancient outlets of mountain lakes according to Volney's theory, but as no fossil remains of fresh water animals are found therein, it is very probable that they were inland seas and gulfs of salt water when the Atlantic States were under water. The hudson basin above Newburg was also such an inland sea. All the fossils of these inland seas are marine exuvia of very ancient date with a few diluvial remains.

The principal ridges skirting this Aleghany tableland are to the east, 1 Turtle mt, 2 Sideling mt, 3 Tuscarora mt, 4 Kitaniny mountain, which are from 5 to 10 miles broad and properly paralell spurs of the Alleghany separated by narrow valleys while the 5th or most easterly is separated by a broad valley, is of a different and more primitive formation, forming a tableland from ten to twenty miles wide; it is a long spur of the primitive Mattawan mountains, called Schooley mountains, in New-Jersey, South mountains in Pennsylvania, Blue ridge in Maryland and Virginia; but it is continuous only broken through by 5 River gaps, although primitive it is much lower than the second Alleghany, averaging only 1000 feet or one half of the average of the Alleghanies, yet it must be recollected that at the N. E. it rises to 7000 feet in the White mountains, and at the S. E. to 4500 feet in the Apalachian mountains, uniting these two distant groups by a long narrow band or chain.

Beyond it easterly are two or three smaller ranges of hills forming as many steps and chiefly primitive; they bear many different names from New Jersey to Georgia, Pigeon hills West of Susquehannah, Monocacy in Maryland, Bull hills in Virginia, Yeona and Hope hills in Carolina and Georgia, yet they are consimilar forming chains broken by the streams, and average 500 feet in height, but more to the N. and S. at the ends.

In a N. W. direction from Philadelphia to Lake Erie,

many more mountains, ridges and table lands are found with peculiar names, being formed by the valleys breakings.

Westerly of the Backbone mountain is the Laurel mountain or ridge 7 to 15 miles broad; next the Chesnut hills, or ridge, after which comes a hilly broken region 200 or 300 miles broad North of the Ohio river extending spurs through Ohio called Scioto hills forming the Silver hills of Indiana, the Wabash hills of Illinois, and separated from the the Ozark mountains by the Mississippi valley and gap of Girardeau.

South of the Ohio river in Kentucky is a large hilly table land, called Knob hills or Wasioto of the Indians, uniting with the Scioto hills at the Scioto river, with the Silver hills at Salt river, and with the Wabash hills below the Wabash river. This range or tableland is very irregular and I have traced it throughout in Tanner's map, the height over the low lands or limestone plains, varies from 200 to 500 feet, or higher still East when called Pine mountains. It is properly a spur 400 miles long of the Cumberland mountains, and of the same geological structure slaty and grity.

The Cumberland or Wasioto mountains fill the whole of West Virginia, giving rise to many rivers. It is properly a Plateau or the Western step of the Alleghany, forming North a broken ridge ending at the Ohio, and South a broad tableland in Tenessee, sending West a spur called the Buffalo hills, dividing the waters of the Cumberland and Tennessee rivers. South of the Tennessee river are the Apalachian mountains, the least known of all our mountains, and which I pant to explore; they are represented as a winding ridge running East to West, but are probably also a tableland with aprons and spurs, giving rise to the rivers falling in the gulf of Mexico. Their structure and geology is hardly known; but they are deemed secondary and filled with fossil remains to the West in Alabama and Mississippi, while they meet in Georgia, by the Lookout mountains with the primitive Cheroki mountains at the head of Cuza or Coosa river, these last are here very lofty 4500 feet high, yet called the Blue ridge on its South West end, but are the end South East of the Alleghanies collectively. This long East ridge is very winding through the Carolinas and Virginia, unbroken by rivers, except by James' river near the Otter Peaks, the Central knot of this primitive chain. It has many other chains and groups of peaks.

It is very remarkable that S. of James' River, this chain becomes the loftiest, and divides the Waters of the Atlantic and Ohio basin: while the secondary Alleghany ranges westerly becomes lower and broken by the water gaps of the many rivers forming the Kenhaway and Tennessee.

This is a peculiar feature of

these mts in direct contradiction with the northern features. Another is found in the Unaka mts. (dividing N. Carolina from Tennessee) forming a narrow winding ridge 4000 feet high, primitive on the eastern slope and secondary on the western slope. The Cowita mts also primitive are E. of it and W. of the Blue Ridge, 3000 feet high.

In east Tennessee or west of Unaka mts are 3 ranges of mts between the branches of the Tennessee river. 1. Chilhowi 2500 feet. 2. Bay 2100 feet. 3. Clinch 2200 feet. and lastly comes the Cumberland mts 1800 feet, which by Walden mt to the N. and Lookout mt S. form the great Tennessee water gap.

Many names are given to these ranges in Virginia, between the stream of the Potomac and Kenhaway branches; but they are mere continuations. The Unaka mts become the Iron mts, and S. of James' river head, connecting transverse chains, bind and blend together the primitive and secondary ranges in a very curious way not yet geologicaly explained.

Thus far from the Alleghanies being a mere bundle of parallel ridges as geographers and geologists have supposed through false surveys, we find them a vast and lofty mass of mingled mountains, tablelands, peaks, hills, groups, knobs, spurs, steps, aprons, slopes, winding chains and some parellel ridges: nearly 1500 miles long from N. E. to S. W. and very unequally wide, with all the geological formations among them.

There is nothing exactly like elsewhere in the world: the Pyrenees, Apennines, Carpathian, usually compared are totally different in structure and configuration. Therefore these interesting mts demand the utmost attention from the geographer, geologist, mineralogist, botanist, and philosopher. I mean to explore them every year over again. Their valuable mines of coal, iron, gold, &c. begins to draw the attention of many; but I will seek there the unexplored fossils, flowers, animals and precious stones which I know they contain: taking maps and surveys of remote valleys and ranges to add to general knowledge.

Is it not strange that while our political geography (which is fluctuating every year) is so much attended to, altho' new maps are needed every year to show new counties and towns: physical geography, which if once well drawn, would be forever permanent, has been so utterly neglected, or so long improperly understood?

C. S. Rafinesque.

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122. The Patagons.

The nations dwelling in Austral America were thus nicknamed by Magellan, in 1520, from two Catalan words meaning *hoof paw*. For 312 years past, they have been the subject of romances, fables and systems. All the nations S. of

Buenos Ayres have been deemed Patagons, altho' stated by others to consist of several nations and tribes, different in size, complexion and language.

Many writers call them a race of giants and lately even a peculiar species of man! while others deny their great size and even their existence! It would be tedious to enumerate all the various false opinions to which they have given rise.

Molina and Falkner's more rational belief deserve alone attention; they deemed these Patagons only a branch of the Aucas or eastern Chilians, who are known to be often of a very tall size.

But even this system is erroneous, because the languages and complexions of the various Austral tribes, were not well attended to. Yet Pigafetta the historian of Magellan voyager gave a vocabulary of the true gigantic Patagons, and described them as tall men 7 feet high of a yellowish complexion, painting their bodies and wearing skin mantles. While the Aucas or eastern Chilians of the Andes altho' often nearly as tall are of a different complexion and language, do not paint and wear woollen ponchos.

By comparing carefully and critically the accounts of fifty travellers and historians, I have ascertained many tribes in Austral America, which shall be distinguished and described in the first vol. of my history of America (upon Austral America.) They may be reduced to 3 real nations; 1. The Aucas or Chilians, 2. the Puelches or Talahets, 3. Cunis or Poyas, which are all intimately connected altho' divided into 30 or 40 tribes.

All have been called Patagons by some travellers, but the original Patagons of Magellan are only one of these tribes, called *Tinguis*, *Tiniguis*, *Tinguiches*, *Guidiches*, *Keyus*, *Tiramenets*, *Capacs*, &c. by various authors, and dwelling near the strait of Magellan to the Western side, from whence they ramble in summer to the Eastern shore. They belong to the Poyas nation extending from South Chili to Statenland, which do not speak Chilian.

Capt. Morrell appears to be the last traveller who has seen these true Patagons in 1823 and 1826; but without knowing them as realy such. By 5 words of their language mentioned at random they are the same as those of Pigafetta. Such as God *Setedos* M. *Setebos* of P. &c. He visited two of their villages on the R. Capac, lat. 52 and 53, of 4000 and 2000 population. Their complexion is pale yellow, they paint, wear skin mantles, and thus are like those of Pigafetta. The tallest was 6 feet 4, but he saw in tombs, skeletons of 7 to 8 feet.

The vocabulary of Pigafetta is of the utmost historical importance. It has enabled me to trace the origine of these Patagons, since I have detected in it 81 pr cent of analogy with the *Çairi* of Trinidad Id.

and 77 per cent with the *Taino* of Hayti in the 16th century, both spoken by Aruac nations.

This fine nation seems to have overspread South America to the very end, altho' it may be one of the last come from the East, since nearest to the Atlantic shores, and with striking philological analogies with the ancient nations of Europe and North Africa.

The Aruacs were spread over all the West Indies, except where driven off by their foes the Caribs, they were mingled with them in Guyana, Columbia and Brazil, under many names; even the Taos or Chiquitos of Chaco appears to have been a branch, since they have 80 per cent analogy in languages with the Taino.

The famous Muhizcas so early civilized were also a kin to them, since they have 62 per cent analogy with the Tao, 67 per cent with the Patagon.

The other nations of South America with 50 per cent and upwards analogy with the Patagons are,

Darien 68 per cent.
Mbaya 64 per cent.
Lule and Vilela 50.

While in North America we find the Mayan, Chontal and Poyais each 60 per cent. Tarasca 50 &c.

Thus becomes evident how absurd and erroneous is the opinion that American languages have no mutual affinities, and that the Patagons are a peculiar species of gigantic men.

C. S. R.

123. N. G. Cauloma. Raf.

This is a fine N. G. of radiate plants, discovered in 1818 in the barrens of West Kentucky, deemed then doubtful, seen again in 1823 and ascertained to be a peculiar G. near to *Rudbeckia* and *Sarcheta*: the name means edged stem.

Cauloma. Perianthe in double series 12 parted, Phoranthe convex, with biform chaffs, external flat membranaceous, internal linear carinate, amplectens, thick above. Rays 12 bidentate. Seeds oblong compressed naked, no teeth.

C. *tomentosa* Raf. Stem virgate simple, angular winged, wings tomentose; leaves sessile remote decurrent, lanceolate rhomboidal, tomentose, end serrate acuminate: flowers terminal glomerate subsessile tomentoes, perianthe lanceolate acute, rays yellow lanceolate.

A singular plant 1 or 2 feet high, entirely wooly, blossoming in June and July.

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124. Principles of the Philosophy of new Genera and new species of Plants and Animals.

Extract of a letter to Dr. J. Torrey of New York dated 1st Dec. 1832.... I shall soon come out with my avowed principles about G. and Sp. partly announced 1814 in my principles of Somiology, and which my experience and researches ever since have confirmed. The truth is that *Species and perhaps Genera also, are forming in organized beings* by gradual deviations of shapes, forms and

organs, taking place in the lapse of time. There is a tendency to deviations and mutations through plants and animals by gradual steps at remote irregular periods. This is a part of the great universal law of PERPETUAL MUTABILITY in every thing.

Thus it is needless to dispute and differ about new G. Sp. and varieties. Every variety is a deviation which becomes a Sp. as soon as it is permanent by reproduction. Deviations in essential organs may thus gradually become N. G. Yet every deviation in form ought to have a peculiar name, it is better to have only a generic and specific name for it than 4 when deemed a variety. It is not impossible to ascertain the primitive Sp. that have produced all the actual; many means exist to ascertain it: history, locality, abundance, &c. This view of the subject will settle botany and zoology in a new way and greatly simplify those sciences. The races, breeds or varieties of men, monkeys, dogs, roses, apples, wheat.... and almost every other genus, may be reduced to one ora few primitive Sp. yet admit of several actual Sp. names may and will multiply as they do in geography and history by time and changes, but they will be reducible to a better classification by a kind of genealogical order or tables.

My last work on Botany if I live and after publishing all my N. Sp. will be on this, and the reduction of our Flora from 8000 to 1200 or 1500 primitive Sp. with genealogical tables of the gradual deviations having formed our actual Sp. If I cannot perform this, give me credit for it, and do it yourself upon the plan that I trace.

C. S. R.

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125. N. G. SCADIANUS. Raf.

A beautiful liliaceous plant of Louisiana, with splendid umbella of azure flowers, has long been know in our gardens near Philadelphia and our books of botany as the *Crinum Americanum;* which I have lately ascertained to be very different from that South American plant, and it is now astonishing to me how it could have been thus misnamed, since it is *not* even a *Crinum;* but a N. G. and totally distinct from the plant of Linneus, as the following comparison will shew.

Crinum Americanum. Descr. of L. leaves oblong carinate undulate, bipedal, very broad. Scape compressed, flowers yellowish white, fragrant, segments uncinate reflexed.

Our plant, thus wrongly called by Pursh, Nuttal &c, has leaves ligulate flat, acuminate, pedal, breadth uncial. Scape round, flowers blue, inodorous segments erect not uncinate!!!— Thus not a single character is alike. What they have in common is merely a large bulb, thick leaves, a scape, a multiflore umbel, &c. If it is to be a *Crinum* it must be called *Cr. ceruleum* Raf; but it is not, having unequal stamina, &c.

Linneus was apt to form his

genera on a single Sp. and refer others by mere habit. He has done so here. His G. *Crinum* contains 3 or 4 separate G. The *C. nervosum* must form the G. *Stemonix* by unguiculate filaments and polyphyllous umbel. L'Heritier has made the G. *Agapanthus* with *Cr. africanum*. Others are refered to *Amarylis* and *Hemanthus*. I propose to call this *Scadianus* meaning blue umbel, and thus define it.

Corolla with tube oblong, limbus equal campanulate, six fid, segments canaliculate, 3 broader obtuse, 3 narrower acute. Stamens, 6 unequal curved filiform. Pistil oblong, free. Style filiform streight, stigma simple.

Compare this with *Crinum & Agapanthus*.

This plant gave rise to another singular blunder. It grows in the marshes of New Orleans, and is called Blue Squill, whence it was mistaken for the true Squill or *Scilla maritima* and collected as such! but was found more suitable to adorn gardens than pharmacies.

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126. *On 3 N. G. of Land Shells from Buenos Ayres in South America. By C. S. Rafinesque.*

They are from the cabinet of Prof. Green, where they are not labelled, and who permitted me to describe them.

1. *Siphalomphix*, Raf. N. G. shell conical, opening oval acute, end rounded, columella twisted with a tubular ombilic. It differs from *Agathina* by the columella and ombilic.

S. bonariensis, Raf. or Ag. bonariensis, Raf. Six spires tip nearly obtuse, first spire with a transversal angle—shell about one inch long, whitish semi-transparent, brittle.

2. *Stegomphix*, Raf. N. G. shell oval opening nearly round lips not quite joined, the internal covering a small spiral ombilic.—Therefore different from *Cyclostoma* and *Paludina*.

St. elegans, Raf. (*or Cyclostoma*) oval with 5 spires, white, end nearly obtuse yellow, spires with many small prominent transversal strias.—One inch long or less very pretty.

3. *Diplicaria*. Shell oval, opening oval, columella broadly plaited with 2 folds or thick oblique ribs.—Near *Voluta* and *Torticella*, but not marine.

D. bonariensis, Raf. Oval obtuse smooth olive color with 2 spires only—small shell of half inch.

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127. *On 5 New Fresh Water Shells, of Bengal and Assam in Asia.*

They have been collected by Dr. Burroughs and are in my cabinet.

1. *Planorbis albescens*, Raf. nearly smooth whitish flattened on the right side with 3 raised spires, only 2 on the left in a hollow, opening hardly oblique. Size above half inch.

2. *Paludina vitula*, Raf. oval conical acute, 5 spires, swelled before, olivaceous with narrow spiral brown bands.—Size about one inch long.

3. *Paludina fragilis*, Raf.

oval swelled acute, 5 spires, smooth brittle, of a uniform dark or pale horny color.—Smaller than the last.

4. *Melania tessula*, Raf. oblong, brown, seven spires, somewhat tesselated by prominent ribs and small spiral strias, about one inch long, I have 3 varieties. 1. first spire with duplicate strias—2. do. single strias, knoby tesselate shorter. 3. do. strias nearly obliterated. Are they different Sp?

5. *Melania costula*, Raf. elongate, olivaceous brown, 7 or 8 spires, all with regular angular ribs lengthway, the first spire with a spiral angle ending at end of opening. Over 1 inch, from the river Ganges.

COMMERCIAL ENTERPRISE.

The hints in No. 1, of this Journal on Scientific Voyages have not been thrown in vain. Dr. Burroughs is gone on another voyage of trading and collecting Natural objects in South America and China—Other similar voyages as connected with Sealing are preparing in Baltimore Albany and elsewhere. I was applied to from Albany, to go and direct such a voyage of Natural Sciences, which I have been compelled to decline, as I had stated I only claimed the merit of drawing the attention on the subject, and would confine my future travels and discoveries on dry land; but have recommended to employ young naturalists or Students, some of whom have applied to me to go on such an honourable enterprise. Captain Morrell's voyages lately published have evinced how much may be achieved in various Countries with little means.

It would even be worthwhile to set on foot exploring Journeys in our own country: these I might perhaps join. We have many private Explorers now, Audubon, Leitner, Conrad, &c. besitle myself, who collect for sale or museums. Florida, Alabama, Texas, New Mexico, the Apalachin, Ozark, and Oregon mts would above all reward well future labors of this kind.

NOTICE.

The second year of this Journal is begun rather under discouraging difficulties, which might warrant its suspension; but the editor is determined to overcome them if he can. Instead of enlarging the size he is compelled to reduce it, although the price must still be *One Dollar* per annum; but half of this has been found to go towards the postage—taxes of Editors, the same on Journals of $ 1 as on those of $ 10. The supporters of this Periodical having chiefly been Scientific men, it shall be made still more scientific if possible.

Those who paid $ 2 in advance in the expectation of an enlarged Journal, will be satisfied by the additional present of a Work of the Editor's, who offers them his thanks for their support: his other friends he hopes will enable him to complete a volume at least of this repository of Science and facts, by sending him the rate of this year.

Account of the Botanical Collections of Professor C. S. Rafinesque.

I began to herborize and collect plants in 1795, when a child. In 1815, I lost by my shipwreck all my early herbals of Europe and America, made during 20 years; among which a superb herbal of Sicily of 2000 species and 20,000 specimens. In 1816 I began over again in N. America, and have collected in 18 States and Canada during 16 years, have received besides, plants from all the States and Territories, from Missouri, Oregon and Texas, to Florida, explored our botanical gardens and public herbals, and exchanged with European botanists.

My own herbals contain now about 4200 N. American species, 5000 varieties, and 25,000 specimens, nine tenths of which have been collected by myself, and after exchanging or selling already 10,000 specimens. My foreign herbals contain about 3,000 species and 8000 specimens from Europe, Asia, Africa, Polynesia, South America and Mexico. I have travelled for this nearly 15,000 miles, of which 5000 as a pedestrian botanist over N. America. My plants are chiefly phenogamous.

Those who have added to my N. Amer. herbals, are

1. *Ladies:* Miss Jane Short, Mrs. Mary Holley born Austin, Mrs. Wallace, Martin, Betton, &c.

2. *Professors and Doctors.* Drs. Torrey, Short, Miller, Ward, Crockatt, Hart, Macwilliams, Brereton, Mease, Brickell, Mitchell, Eddy, Crawford, Locke, &c.

3. *Botanical Authors.* Bradbury, Lewis, Beck, Elliot, Conrad, Halsey, Eaton, Muhlenberg, &c.

4. *Gentlemen or Gardeners,* &c. Gaissen, John C. Short, Ridgely, Hingston, Robert and John Carr, Steinhauer, Booth, Macarran, Knevels, Shultz, Waterhouse, Adlum, Forrest, Durand, Walton, Limner, &c.

Those who have added to my exotic herbals, are

Decandolle, Moricand, Trattenick, Sieber, Bory, Hooker, Swainson, Sheperd, Romer, Shultze, Carr, Lesueur, Bivona, &c.

Those who have bought or received some of my plants are, Decandolle, Moricand, Torrey, Collins, Elliott, Maclure, Radi, Savi, Swainson, Bory, Vandermalen, Agardh, Schreber, Arnott, Hooker, Bastard, Lanthois,

Muhlenberg, Schweinitz, Conrad, Carr, &c. Many of my new plants are to be seen in their herbals.

After this statement it will be idle to say that my new plants are not well known. Any one can see them or possess them by paying for them. I have in my herbals 1000 N.G. or N.Sp. or very rare plants, to show or sell, already published or to appear in my supplemental Flora.

I have divided my American herbals for my convenience and illustration of botanical Geography, into 5 separate herbals of as many regions, in pink paper 14 inches by 8, according to the natural orders and genera.

1. *Alleghany or Atlantic Herbal* of plants of the Atlantic states, and mountains from New England to Virginia, about 2000 species.

2. *Florida Herbal* of plants of the southern region, extending from Florida to Carolina and Pinebarrens of New Jersey, about 1500 species.

3. *Louisiana Herbal* of plants of the Western regions, or the Mississippi and Missouri valleys, from Louisiana and Texas to Illinois and Missouri, about 2000 species.

4. *Oregon Herbal* of plants of the Oregon mts. from Upper Missouri to the N. W. coast, only 700 sp. with me as yet.

5. *Canada or Boreal Herbal* of plants from the Arctic regions, Canada, Labrador, Groenland, and extending south to the great lakes, white mts, and Siberia, about 1200 species with me.

Many plants are of course common to several of those 5 regions, but each are distinguished by a peculiar vegetation and some botanical features: as Pickering has partly unfolded in his Botanical Geography of North America for 3 at least. Decandolle has also stated that we have 3 botanical regions, the Arctic, U. States and Oregon; out of the 20 of the whole world! Eaton has made only 2, Northern and Southern, but we have 5.

Besides these 5 regular Herbals, I have 12 other Extra Herbals: 1 and 2, N. G. and Sp. of Dicotyle and Monocotyle plants. 3, Grapes of N. America. 4, Trees and Shrubs, Do. 5, A medical Herbal of all our medical plants, with the officinal plants of Europe, Africa,

Asia, &c. 1000 sp. 6, Extra herbals for sale, gigantic size to please those who like those. 7, ditto, good size. 8, ditto, Portable herbal of small plants. 9, ditto, Superb Herbal of beautiful showy flowers and plants, of all parts of the world, 800 sp. 10, Marine Herbal. 11, Diseased plants and monsters. 12, Agricultural herbal.

To show the rich contents of these herbals, it will be sufficient to state that of some genera which I keep together for monographs and peculiar study, I possess N. American species of

Pyrola, 15 species.	Vitis, 36.	Gentiana, 20.
Prunus, 32.	Rosa, 24.	Clintonia, 7.
Tradescantia, 15.	Viburnum, 22.	Pavia, 7.
Commelina, 10.	Lobelia, 18.	Anychia, 10.
Unisema, 9.	Heuchera, 9.	Onoclea, 5.
Dodecatheon, 8.	Trillium, 25.	Iris, 12.
Viola, 40, &c.	Mesadenia, 10,	Samolus, 5. &c.

And in the same proportion with many other genera: thus have I increased 50 genera of our Flora, like Fraxinus, Carex, Quercus, Salix, Aster, Ranunculus, &c. have been by others. Whenever one of our plants has been deemed by any botanist similar to a European one, I have tryed to put alongside the European plant, to show the difference or similitude.

Besides these 27 N. American herbals I have 15 foreign or Exotic herbals. 1, Of England and France. 2, Alps. 3, Germany, Hungary, and Russia. 4, Italy and Sicily. 5, Greece and Candia. 6, Asiatic herbal of Palestine, Syria, Persia, and Caucasus. 7, Plants of India and China. 8, Polynesian herbal. 9. Herbal of Egypt. 10, Cape of Good Hope. 11, Africa. 12, South America. 13, West Indies. 14, Mexican States. 15, Mosses and confervas of all parts.—Of many of these I have but few species, altogether about 3000.

As I travel every year I hope to add yet many sp. chiefly of the Southern States. I shall perhaps visit Tennessee, Carolina and Alabama this year.

I offer to sell, buy or exchange such plants or any other. My price for my N. G. and N. Sp. is $ 10. per hundred, the same for gigantic plants. Other American

plants at $ 5. labelled, or $ 4. unlabelled, per 100. Rare plants, at $ 6. to 7. Small plants in portable herbals at $ 3. to 4. per. 100. These prices must be paid here on delivery. If sent abroad or far off 20 per cent. must be added for insurance, packing, trouble and delay.

Of about 225 N. Sp. of exceedingly rare plants, of which I shall publish a list; I have only one specimen left, which I hold at 20 cents each, and even some at 25 cents, and will not even sell unless I know that they shall be deposited in a public or well known herbal, where they may be seen.

N. American and Mexican plants which I have not, I am willing to buy at the same rate, deducting 20 per cent. for my commission, or more, if unlabelled; I take them in payment of my Atlantic Journal and works, where my N. G. and Sp. are described.

Exchanges will now be seldom made, unless for plants of new localities or that I have not, which it is impossible to ascertain unless I see them. Whatever will be sent me, will be duly valued, and the equivalent paid in plants asked, or books, or money.

C. S. RAFINESQUE, Prof.
No. 59, North Eighth-St.

Philadelphia, April, 1833.

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Nr. 6.

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VOL. I. PHILADELPHIA, SUMMRE OF 1833. No. 6.

Article 130.

EPIDERMIC VARIETIES OF MANKIND.

These varieties in the skin of men are now known to be so numerous, that they require a classification: the name of *Albinos* often given them, not applying except to a few. They are all *Natural deviations* in the tissue and color of the skin, extending also to the hair and eyes; occasionally evolved in all the parts of the world, and springing from parents of a different hue.

First Series. ALBINIC VARIETIES or Natural Deviations, by bleaching the skin and hair, or passage from dark to paler or whiter complexions. *True Albinos.*

1. Var. *Lactins.* Skin milk white, hair white, silky, eyes often red and weak.

2. Var. *Albins.* Skin white or bleached, neither florid nor milky, hair bleached or grey and silky, eyes blue or whitish.

3. Var. *Palins.* Skin pale or brownish (like coffee and milk), hair rufous or ashy, eyes slaty or redish.

4. Var. *Scalins.* Skin white scaly, cheeks florid, hair pale silky, eyes blue and weak. *In Polynesia.*

5. Var. *Quimos.* Skin pale tawny, hair pale, short, wooly, eyes pale, dwarfish body, long arms, &c. *In Madagascar.*

Second Series. MELADIC VARIETIES, or Natural Deviations by mixture of dark and pale colors. *Spotted Men.*

6. Var. *Meladins.* Skin half white or pale, and half brown or black, hair and eyes variable, little deviated.

7. Var. *Pintados.* Skin with brown or black spots in the white race, pale or white in the black race, hair silky, and often small eyes.

8. Var. *Lividins.* Skin with irregular spots of a livid red color, called birth spots, or bloody spots; not a disease,

but a natural epidermic deviation.

9. Var. *Lenticulins.* Skin more or less covered with small lenticular spots of a rufous or brownish color, hair redish, eyes grey or rufous. Not uncommon with us, and seen also by Labillardiere among the Albinos of Papua.

Third Series. OBSCURIC VARIETIES, or Natural Deviations by darkening the skin and hair, or passage from white and pale to obscure and darker complexions.

10 Var. *Fuscatins.* Skin brown, hair crisp, eyes black. Common.

11. Var. *Atrins.* Skin wholy blackened, hair curly, eyes dark or black. Happening among white men.

12. Var. *Rubrins.* Skin wholly redened, as seen by Lander, among the Negroes in Africa. *C. S. R.*

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131. COMPLEXIONS OF MANKIND, &c.

It appears that there are men of every color, except blue and green! such as, 1 Milk white, 2 Pale white, 3 Florid white or Rosy, 4 Bedish, 5 Red, 6 Tawny, 7 Brown, 8 Brownish, 9 Yellowish, 10 Olivaceous, 11 Coppery, 12 Grey, 13 Ashy, 14 Coffee and milk, 15 Rusty, 16 Sooty, 17 Chocolate, 18 Black, 19 Ebony, 20 Spotted, &c.

All these colors and hues are found in America as well as in Africa, Asia, Polynesia, and even Europe. They are no wise permanent, but are liable to vary, fade, blacker or darken, disappear and reappear!

Thus facts and experience evince how idle have been the systems and disputes on these colors and on Negroes. It is now doubtful even what is a Negro! Since there are presumed Negroes of all colors and hues, with wooly or long and silky hair, ugly and handsome features, &c.

The size of mankind varies from 2 feet in dwarfs to 8 feet in giants, the usual size from 4½ to 6 feet.

The features and limbs vary every where, even in the same families. Some white men have thick lips and flat noses, while some black men have sharp noses and thin lips.

The color of the hair is of all colors except blue and green; as the skin, it varies in the same families, as well as the texture silky, lank, wavy, curly, frizzled, spiral, wooly, lumpish, &c.

The eyes are of all colors, not even excepting blue and green. I have seen a family where seven colors were found; blue, green, grey, brown, hazel, black, and mixt.

Let us learn to pause before we form opinious out of a few facts. Truth can only be detected by extensive observations. Respecting mankind the result of those made all over the world demonstrate that man is a variable being, like every other, and subject to the ETERNAL DIVINE LAW OF PERPETUAL CHANGE AND

MUTATION, in form size and complexion as well as manners and improvements. Whence we ought to love each other whatever be our shape, bulk and hue, as brothers of a single great family.—

Each Genus of Animals and Plants is also a similar family, with few or many old deviations which we call species, and varieties, at random! It is so with the dogs and cats, goats and mice, hawks and sparrows, ducks and gulls,—frogs and turtles,—herrings and carps,—flies and moths, &c. among animals.——And oaks, vines, apples, cherries, roses, lilies, rice, barley, wheat, gentian, spunges, &c. among trees, shrubs, flowers, and plants.

Whence genera are of more importance than species, and ought to be closely studied or accurately fixed; but we are far from this as yet; species have been too much attended in preference. But genera are not few, many thousands of new ones exist as yet, since almost every genuine or primitive species will be found to constitute a peculiar genus.

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132. Affinities of the English Language with the African Languages and Dialects of Egypt, &c.

Extract from my Philosophy of the English Language.

In Africa a great obscurity prevails on the subject of Philological and ethnological classification, nearly equal to the American perplexity. We know but few of the primitive languages of that continent; but among the modern we find dialects of several languages widely spread across the whole of Africa, and each offering striking analogies with the English, even among the Negro nations.

I shall enumerate the African languages under 3 classes. 1 Ancient African languages. 2 Languages of the Brown nations. 3 Of the Black or Negro nations.

I. Ancient Languages of Africa.

Those of which I can offer comparative tables are merely 1 Coptic. 2 Ammonian. 3 Lybian, and 4 Guanche.

1 Lang. *Egyptian or Coptic.*

This was the language of ancient Egypt, already spoken 4500 years ago, and which became extinct only towards 1620. But we have many books, inscriptions, and manuscripts in that langnage. It has considerable analogies with the Pelagian, Scythian, Sanscrit, and primitive dialects of Asia and Europe. It extended to Nubia, Abyssinia, and part of Lybia, in many dialects, 3 of which prevailed in Egypt. 1 The Theban, 2 the Memphitic or Northern, which changed P into PH or F, and K into Kh or X, 3 the Bashuric, changing R into L.

The primitive Phonology of Coptic, was very simple. It had only 12 letters, which were often diphonous or polyphonous—3 vowels, A, O or U, E or I, the simple consonants

were B, M, N, S, the polyphonous D, T, Th—G, K, X—R, L—P, F, and the aspiration H. But in the later times the Coptic adopted several Greek and Hebrew letters, some dipthong vowels, so as to increase the alphabet to 30 letters, which were represented by many sighs and symbols called Demotic or popular, hieratic or sacred, and hieroglyphical or symbolical.

This language like all primitive ones, was entirely monosyllabic. The modern languages connected with it are many all over the world, and even in America; their roots may often be found in it.

From 252 Coptic words, collected at random for comparison, I find 83 more or less alike with the English, or about 32 per cent. A very great and striking quantity for such remote languages, one nearly primitive and extinct, the other of very late formation; therefore the parents of the English must have been still further connected with the Egyptians.

N. B. I add some French and Italian affinities, Greek and Latin analogies.

Eng. writ.	spoken.	*Coptic.*
Eagle	pr Igl	*Akom*
aquilu Latin Italian.		
Lion	layon	*laboi*
Moist		*mou* (water)
Ray	re	*re* (sun)
Human	yumen	*róme* man
homo Latin.		
Oxen	oksen	*ehenue*
buoi Italian.		
Ass	donkey	*Io*
asino, cucio It. D.		
Cat	kiat	*chau*
chat pr Sha fr.		
Frog		*crous*
grenouille Fr. gr'nulh' Fr.		
Mouth	mouth	*ebot*
bouche, bush Fr. boca It.		
Woman	vumen	*hime*
Female	fimel	*shi*
She	shi	
femme fam Fr. femina It.		
Sister		*set*
House	haus	*ei*
Cabin		*kipe*
huis, old Fr. Casa It. capana It. cabane Fr.		
Soul	sol	*ahe*
Animate	animet	*ame*
ame, am Fr. anima It.		
Abode	ebod	*abot*
habitation, abitasion Fr.		
Life	laif	*aiha. bia*
Live	liv	*ahi*
bios Gr.		
vie Fr. vita It.		
Rush	rosh	*oke*
jonc Fr. junco It.		
Tear	tir	*rime*
lagrima It.		
Son		*si*
fils fis, Fr.		
Egg		*sowe*
uovo, It.		
Cow	kau	*bahsi*
vach' Fr. vacca It.		
Seed	sid	*siti*
Voice	vois	*wo*
voix, vua Fr. você, voshe It.		
Mother		*mau*
madre It.		
Heart	hart	*het*
Merit	mai	*meres*
beloved, aime, eme Fr. ami, It.		
Boat	bot	*baa*
bateau, bato Fr. barca It.		

Fowl	faul	*halet*
volaille, volalh' Fr.		
Be	bi	*pet*
etre F.		
Horse	hors	*htor, htzo*
Canto, or song		*cahos*
canto It.		
Divinity, deity		*noyti*
Heaven	hevn	*neifui*
Old		*hello*
vieux, vielle, viœ', vielh' Fr.		
Summer, somer		*som*
River		*iaro*
rio It. Sp		
Head	hed	*ape*
capo It. Sp.		
Morn		*chorn*
giorno, djiorno It. day.		
Foot	fut	*fat*
Bone		*kas*
os Fr. costa It. rib		
Net or seine, sen'		*chne*
seine Fr. pr sen'		
White	vuait	*wouah*
Wood	vud	*woh*
bois, bua Fr.		
Steel	stil	*stali*
Aliment		*wen*
mange, mang' Fr.		
No		*an*
non Fr. an Gr.		
Froc, dress		*frok*
froc Fr.		
Love	lov	*loblu*
Middle	midl	*miti*
meta It.		
Mean	min	*mini*
Root	rut	*ruti*
Air	er	*aer*
aer Lat. aria It.		
Fruit	fruit	*utah*
frutta It.		
Meridional, south,		*meri*
Stole	hol	*kohl*
Pledge	pledj	*dreb*
are Fr. capara It.		
Hall		*aule*
aulé Gr.		
Yet		*eti*
eti Gr.		
One	uan	*ua*
Sow	sou	}
Swine	swain	} *eshau*
Tall		*thal*
Dumb	domb	*thom*
muto It.		
Cott, cottage		*kot*
Lick		*legh*
Him		*mim*
Monument		*mhau*
Wish		*wesh*
Free	fri	*remhe*
eremos Gr.		
Sapient (wise)		*sabe*
Six	siks	*sohu*
sei It.		
Save	sev	*sot*
sauve, sov Fr.		
Frost (winter)		*fro*
Shift, change		*shibti*
change, chanj Fr.		
Four	fuer	*Ftohu*
Enough	enof	*enouft*
Job, work		*hob*
opera It. obra Sp.		
Calm	kiam	*gham*
Camel		*ghamul*
Royal		*raoh*
Cave (hev. tabernacle)		*thebi*
caberna Sp.		

133. *Sorex dichrurus*, N. Sp. of Shrew.

I discovered this new small quadruped, in 1826, at the falls of Niagara; it had been caught even on Goat Island, in the middle of the falls, and preserved in the Museum of the Falls. It must dwell both in Canada and New York, but is rare, not having seen it elsewhere.—The specific name, means tail bicolored.

Sorex dichrurus. Raf. Fulvous, back brown, belly white, tail longer than body, nodose, with a pencil of hair at the tip, fulvous above, white beneath.

Small animal, similar to a mouse, and to some sp. of *Gerbillus.* Body 3 inches long, tail slender, 4 or 5 inches, head slanting, and elongated, snout sharp, eyes oblong, ears small oboval.

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134. FLORULA TEXENSIS. DICOTYL. N. Sp.

New Dicotyle Plants of Texas & Arkanzas, in my Herbarium.

1. NUDILUS N. G. Raf. Dioicus. Fl. masc.---Fl. fem. Cal. & Cor. o. Pist. ovat. Styl. longus, stigma capit. Bacca 1 sperma. *Frutex fol. opp. s. alt post anthesis. fl. fascic.* Singular G. near to *Borya* and *Ilex.* —*N. paradoxus.* Raf. Ramis teretis nudis levis, fol. lanc. sessil. glabr. acut. integr. fasc. alt. Fl. parvis pedic. racemosis s. 2–4nis. Flowers naked small vernal. From Texas to Tennessee, very rare, seldom seen in blossom, berries ovate black.

2. *Lobelia texensis Raf.* Puberula, Caule flex. simpl. Fol. sess. lanc. dentic acutis remotis, Fl. racem. secund. remotis, ad bract. lanc. axill: ped. fl. & bract. brevior, Cal. lac. linear. Cor. magna coccinea, lac. angust. acutis. Beautiful sp. near to *L. cardinalis,* and *L. Fulgens. v. v.*

3. *Pentostemon atropurpureum* Raf. Caule virg. simpl. ter. Fol. ang. lanc. amplexic. serrul. glabr. acutissim. Fl. racem. bracteis ovat. lanc. acum. integris. Pretty sp. with small fl. dark purple, *v.v.*

4. *Gratiola brevifolia* Raf. Glabra simplex, Fol. breviss. ovatis acutis integris remotis, Fl. axill. ped. fol. longior, Cor. incurva. small 4 in. fl. small purplish.

5. *Gratiola rigida* Raf. Glabra, rigida, Caule anceps. Fol. rhomboideis, basi cuneatis integris, apice serratis obtusis, Pedic. angul. fol. longiorib. Cal. sine caliculo.—Fine sp. lacking the 2 bracts, Cal. deeply 5 parted, segm. linear lanc. unequal, one superior broader, caps. oblong acute. Probably a peculiar S. G. *Aotilix* Raf.

6. *Lantana parvifolia* Raf. Ramis Virgatis obt. angul. apice puberuli, Fol. oppos. petiol. ovato-obl. parvis, crenatis, subacut. supratransv. rugosis, subtus tomentosis, Capitulis fol. brevior, paucifloris, bracteis imbricatis ovatis integris. —Small shrub, very distinct from *L. floridana & L. camara.* Sea shore *v. v.*

7. *Nyssa ciliata* Raf. Fol. ovat. obovatisque, integr. utrinq. acum. ciliatis, petiolis nervisq. basi hirsutis. Pedunc. fem. trifloris hirsutis, bract. brev. membr. obt. fl. sessil. Stylo elong.—Different tree from N villosa.

8. *Negundium trifoliatum* Raf. Ramulis viridis levis, Fol. trifol. ovatobl. glabr. acut. integris, media sepe tridentata, Fl. dioicis masc. 4 andris, cal. 4 dent. pedic. fascic. filiformis, fl. fem. racemosis, cal. 4 part.

linear. pist. bipart, incurvis forceps emulans, stylis in forceps. *v. v.*

9. *Celtis longifolia* Raf. Ramulis gracilis verrucosis, apice hirsutis. Fol. distichis, elongato oblongis acum. basi obliq. truncatis, equal. serratis, supra scabris, subtus reticulatis, pedic. solit.

10. *Fagus rotundifolia* Raf. Ramulis fuscatis levis. Fol. Subrotundis repandis acutis, petiolis nervis marginiq. hirsutis sericeis. Capitulis sepe geminatis, ped. bracteisq. sericeis.—Differs from *F. sylvatica* by the round repand leaves &c.

11. *Euphorbia (Esula) leucoloma* Raf. 1820. Glabra, Caule erecto fol. sessil. obov. acut. integr. Umb. trifid. bract. fol. similis marg. albo colorato, Periantho apice albo 4 lobo, capsulis villosis.—Var 1 *Simplex*, 2 *Elatior*, 3 *Cuneifolia*, autumnal plant. *E. marginata* of some Bot. not of Kunth. v. v.

12. *Achillea gracilis* Raf. Caule gracile striato, Fol. remotis angustis, infimis petiol. recurvatis, pinnatis, foliol. ang. pinnatif. corymbo parvo coarctato. Semipedal, fl. white.

13. *Fedia brevifolia* Raf. Caule gracile furcato, fol. remotis paucis brevis, spatul. obl. obt. integr. Fl. paucis geminatis, bracteis ovatis acutis, seminib. 4 dentatis—semipedal.

14. *Polemonium quadriflorum* Raf. Caule erecto ramoso, Fol. pinnatis, foliolis 11-17 ovatis s.fobl. acut. integr. ultimis confluentibus, Fl. term. sub 4nis. nutans pubescens blue.

15. *Glechoma rotundi folia* Raf. Repens, hirsuta, fol. longepetiol. subrotundis ovatis, repando crenatis.

16. DIDIPLIS N. G. Raf. Cal. camp. 4 fid. Cor. o. stam. 2. stigm. 2. caps. biloc. polysp.—*D. linearis* Raf. Caule erecto, fol. oppos. linear. elongatis integris, fl. axill. sess. solit.—*Peplis diandra* Nutall in. Dec. Quite a distinct G. from *Peplis* 6andr. G.

17. EUTMON N. G. Raf. Cal. 5 phyl. eq. cor. 5 pet. stam. 5 alterna styl. 1, stigma 3 lob. caps. 1 loc. 3 valv. polysp. sem. centralis. *E. napiforme* Raf. Rad. tuberosa, fol. rad. teretib. carnosis, cyma corymb. dichotoma, *Talinum s. Phemeranthus napiforme* Dec. My specimen from a garden is imperfect, but evidently shows that it is a N. S. *v. v.*

18. *Convolvulus griseus* Raf. Volubilis, fol. longepetiol. cordatis subtrilobis, 3 nervis, dentieulatis, acutis, puberulis furfuraceis griseis. Pedic. brevis unifl. Cal. griseus, bracteis binis lanceol. caliculans. Near S. G. *Calistegia.*

19. DESMONEMA N. G. Raf. Perianth. ext. tubul. 5 dent. s. 5 phyl. segm. connivens. Perianth-intern. petaloid. 5 segm. membr. ad ext. brevior, cuneat. emarg. Stam. plurima ad bas. gynophoro inserta, equalis, fascicul. albis filif. vix articul. persistens, simultaneis evolvens, interdum castratis, anth. parvis deciduis. Gynophoro centrale elongato trigono, stam. & cal. longior. Ovar. glabr. glob. apice trilobo, stylis 3 simpl. brevi. Caps. levis 3

cocca. 3 sp. Int. axis centralis 3 alato persist. Coccis deciduis, seminib. croceis obovatis. basi truncat. hilo impressis, latere utrinq. angul. *D. hirta* Raf. 1820. Caule erecto simpl. gracile striato scabro, apice hirto, Fol. oppos. apice alt. petiol. hirtis. ovatis obtusis, obt. dentatis, imis ov. lanc. acum. Umbella term. sessil. fl. brevi ped. Involucro triphyl. fol. simil. s. sessil. bract. lanceol. fl mixtis. Per. ext. s. cal. viride. Per. int. & stam. albis.—Pedale. *v. v.* I have destroyed all my specimens except one to study this singular G. which is very near to *Euphorbia* and *Tragia*, here the Cor. or ext. Per. is free not glued with the external, Stam. persist thus illustr. their structure.

20. *Evax verna* Raf. Canescens sericea, Caule gracile subramoso Fol. laxis semiamplex. obl. obtusiusc. infimis cuneatis, Fl. solit term. bract. ineq. fol. similis, periantho semiglob. squamis paucis subrot.—Texas & Louisiana, triuncial, fl. white, floscules greenish.

21. *Silphium trachopus* Raf. Caule tereto lutescens glabro ramoso, Fol. oppos. amplex. ovatobl. acut. s. acum. integr. scabris, Fl. corymb. ped. scabris. Perianth. segm. ovatis acutis non ciliatis, rad. 20. obl. obt.—Fine sp.

22. *Chrysanthemum angustifolium* Raf. Caule filif. flexuoso apice nudo fol. infimis lineari cuneatis subserratis, imis linearib. integris remotis, fl. term. solit, parv. 8 radiatis albis.—Pedal slender, with small white flowers.

23. *Kernera Simplex*, Raf. glabra, caule simpl. fol. lanc. sagitt. amplex. obtus. imis linearib. non sagitt. racemo brev. fl. nutant. ochroleucis.—Semipedal, annual. I adopt the old G of Medic for the Camelina of later Botanists.

New Plant. Texensis, &c.
Monocot.

24. *Cypripedium bifidum* Raf. Glabrum, caule 1fl. fol. fl. longior, obl. long. acum. bractea lanc. fl. longior, Petalis undul. lanc. patulis, binis internis reflexis angustis, labellum parvus brevior obov. infl. Androphorum bigibboso obtuso bifido.—Small plant flower probably yellow, brown in the dry state, leaves 4 to 5 inches by 1 or 2, striate multinerve. Arkanzas.

25. *Sisyrinchium filiforme.* Raf. Glaucum Caule filif. bialato, unifolio, unifl. folia fl. eq. graminea august. carinata, spatha bivalv. subeq. lanceol. pedunc. elongato filif. ovar. obov. fl. majusc. albo.—Semipedal Arkanzas.

26. *Acorus flexuosus* Raf. Pumilus, fol gramineis angustissimis scapo brevior scapo elongato flexuoso triqueter, uno latere concavo, apice foliaceo gladiato, spica teres erecta obt.—Pedal.

27. *Unisema lancifolia* Raf. Fol. ellipt. s. obl. lanc. basi integr. rotund. s. atten. apice subacut. caule gracil, Cerollis linearib. The *Pontederia lanci-*

folia Mg. and Elliott. different from my U. heterophylla by leaves never cordate at base nor obt. at end *v. v.*

28. *Iris brevicaulis* Raf. fl. ludov. sp. 56. *v. v.*

29. *Ethcosanthes ciliata* Raf. Neog. 1825. *v. v.*

30. *Tulipa bicolor* Raf. Atlantic Journal N 4. *v. v.*

This fascicle of rare S. W. plants contains 4 N. G. 1 S. G. 4 New trees, 2 new shrubs and 24 new plants. Several others will be mentioned in the Monographs of revised Genera.

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135. *G. Dodecatheon* or *Meadia.*

This beautiful G. strictly N. Amer. although Langsdorf mentions one seen in Siberia, will be found as numerous as *Primula!* there are many Sp in Oregon and one has been found by Beechey near the Icy Cape; the following 12 Sp. of the U. St. are in my Herbarium It may now be a matter of doubt which is the true *Meadia and Integrifolium*, many of my Sp. are under those names in authors figures Herbals and gardens; although different plants! All rare vernal plants,

1. *D. cordatum* Raf. Fol petiol. cord. ovat. obliq. sinuato lobatis, obt. lobis ineq. dentat. Scapo angulato, umbella 20fl bract. ovat. pedic. ineq. flex, laxis, Cor. planis obtus. purpurasc. Sent me as *D. meadia* from a garden, totally different, beautiful, large leaves and flowers.

2. *D. ellipticum* Raf. Fol. sessil. ellipt. obl. acutiusc. subrepandis, scapo tereto striato apice anceps, umbella paucifl. 8fl. bract, lanceol pedic laxis curvis, cor. planis. obt. albis. mountains Alleghany Virg. *v. v.*

3. *D. ovatum* Raf. sessil. ovatis obtus. basi attenuatis, vix repandis. Scapo tereto, umbella multifl. 20fl. bracteis minimis lanceol. pedic fastig, rectis. Cor. acutis undul. angustis purpureis.—Mountains Unakaand Apalachian. *v. v.* in gard. as *D. meadia.*

4. *D. obovatum* Raf. Fol. petiol. obovatis obtusis vix repandis, scapo tereto apice compr. Umbella laxa multifl. 20fl. ped curvis. Cor undul. obtus. purpureis.—Virginia. *v. v.*

5. *D. Serratum* Raf. Fol. petiol. obl. lanc. obtusis basi cuneatis subserratis, apice remote denticul. Scapo tereto, uno latere sulcato, Umb. paucifl. 8fl. fastig. bract, ov. lanc. Cor. undul. albis. Illinois. *v. v.*

6. *D. parvifolium* Raf. Fol. petiol. cuneatis obl. obt. integr. s. undul, parvis scapo tereto, Umb. pauciil 8fl. bracteis oblongis obtus. ped. curvis, Cor. planis obtus. albis—mts. Cumberland *v. v.*

7. *D. undatum.* Raf Fol. sub. petiol. cuneatis obtusis undatis. scapo tereto, umbella pauciil. bract. ovato lanc. Cor. undatis purpureis.—Mts. Alleghany.

8. *D. Cuneatum* Raf. Fol. sessilib. cuneif. acutis vix repandis, scapo tereto, Umb. fastig. pauciil. 5-7fl. bract. obl. acut. Cor. undul. purp. —Allegh. mts. of Maryland,

v v. Is it the real *D. integrifl*?

9. *D. longifolium (S angustifolium)* Raf. Fol. petiolatis pet. alatis, cuneatis elongatis obtusis integerrimis. scapo tereto apice compr Umbella fastigiata multifl. 10--20, bract ovatobl. Cor. planiusc. obt albis----Barrens of Kentucky, leaves sometimes pedal. *v. v*

10. *D. crenatum* Raf. Fol sessil. oblong. obt. subcrenatis scapo tereto, Umb, laxa pauciſl. bracteis brevissim. subovat. Cor. undul. acut. purpurasc Cal. latinsc. Caps. ovatis. Illinois, *v. v.*

11. *D flexuosum (S. triflorum)* Raf. Fol. subpetiol. cuneatis obt. integris parvis, scapo gracile flexuoso striato, Umb. subtriflora. bract. subul. pedic. brevis, Cor. undul. acut, purpur, Caps. obl.---Missouri, semipedal.

12. *D. uniflorum* Raf. Fol. sessilis lato ellipt. obt. vix. repandis, scapo filif. brevis striato. unifloro, bractea obl acutis Cor. undul. acut. purpurasc.—M. Alleghany. *v. v.*

I have early in April this year discovered in Bartram's Bot. Gard. 2 other New Dodecatheons deemed Varieties of D. Meadia

13. *D. Parviflorum*, R. diff. from *D. flexuosum* by Fol. sessil. spatul. repand. scapo recto, fl. parvis. Found in Pennsylvania, near Norristown on the Schuylkill.

14. *D. obtusum*, R. diff. from *D. ellipticum* by Fol. undatis apice rotundatis margine obscure subcrenul. Scapo tereto levis, umbella 10–12fl. bract. ov. lanceol. From Arkanzas, brought by Nuttall as a white var. of *D. meadia.*

136, *New Amer. Subterranean Plants.*

These are chiefly of the class of Fungi. and are called Truffles or Tuckahos, belonging to the G. *Tuber*, *Sclerotium* chiefly. The *Tubers* or Truffles, grows freely under ground, the *Sclerotiums* or Tuckahos grow there attached to the roots of various trees and plants,

I shall not notice here the other plants growing in caves and clefts, but merely the real *Hypogean* plants. Their history is very confuse as our Botanists have seen few of them, Mitchell, Mease and Macbride have given accounts of some, deeming them all Truffles. This perplexity is increased by the name Tuckaho, a generic Lenapian name for them and all edible roots, deriving from *Tuchai*, their word for bread or bread roots. This word is now used as a nickname given in Virginia to the Lowlanders, called *Tuckahos*, as if they were root eaters.

It is doubtful yet whether we have the true odorous and delicicus *Tuber cibarium* of Europe. Eaton has it, but no Botanist has described it. Schweinitz has no *Tuber* in his fine work on 3098 sp. of Amer. Fungi. I have never seen it, nor indeed any real Truffle (veiny inside) although I have heard of many, which

might be of different G. Bosc, has mentioned one from Carolina, which he has hardly described, it is white, inodorous, but of exquisite taste, and may be called T. *caroliniana*.

His N. G. *Uperhiza*, omitted by all our Botanists! is figured and described in the N. Dict. Hist. Nat. It resembles a Truffle but grows above ground, and has the roots creeping on the surface, whence the name.

The roots of the following plants are called Tuckahos in the Southern States.

Convolvules panduratus, *C. battatas* and *C. macrorhiza*.

Erythrina herbacea.

Apios tuberosa.

Several Sp. of *Sagittaria* and *Helianthus*.

Eaton has only 2 Sclerotiums, Schweinitz has 22, they are all Tuckahos, although not eatable; but the new Tuckahos are large, edible, subterranean Fungi. See my Med. Flo vol ii. N. G. *Tucahus*. If this name is too barbarous, *Gemmularia* or *Rugosaria*, may be substituted. I shall here describe 4 of them.

N. G. *Tucahus* or *Gemmularia*, Raf. Subterranean Fungus, without roots, shape, multiform or amorphous, forming a solid mass, covered by an epidermis with wrinkles or chinks, on which sprout gemmules reproducing the plant.

1 Sp. T. or *G. rugosa*, Raf Oblong mass, inside white, solid, with chinks, outside brown rugose by anastomoted prominent nerves.

Synon. *Lycoperdoides* of Clayton according to Macbride, in Am. M. Mag. N. Y. No. 3, p. 149, who gave a long account of it. He says, that it grows from S. Carolina to Maryland, in all kinds of ground except Swamps; in rich grounds it grows from 15 to 40 lbs weight. When young it is attached to the roots of Oaks and Hickories, but when old is quite free. The inside appears a mass of modified gluten, without starch nor fibrine! The Indians eat it, but it has no smell and little taste. I saw it in 1817 at Dr Mitchill's.

2. Sp. *T. or G. leviuscula* Raf. oblong knobby mass, inside white fungose with chinks, outside fulvous smooth. In Carolina, 6 to 12 inches long, epiderm thin, gemmules small rounded articulated in the hollows. Edible good, inodorous, seen alive.

3. Sp. *T. or G. rimosa* Raf. Mass oblong cuneate one end attenuated, inside white solid without chinks, outside with thick longitudinal flexuose wrinkles and furrows. In Virginia and N. Carol. lately communicated by Dr Mease, who received it from Mr Garnet of Jerusalem. First mentioned as a nameless Truffle by Dr Mitchell Med. Repos. 1812. It grows in rich swamps, has no smell nor taste, but is edible, when fresh a little acrid and astringent, used by Indians for diarrhea. The internal substance has a flexuose breakage, not angular as in the

others. Epiderm thin. 5 to 8 inches.

4. Sp. *T. or G. albida* Raf. Mass rounded whitish, inside white solid without chinks. outside with few chinks, and some short wrinkles. In W. Pensylv. Ohio & Kentucky, deemed a truffle, good to eat. Perhaps this is the *Tuber* of Bosc, but mine had no veins inside, with small gemmules outside. small size 1 to 3 inches.

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137. PLEURADENA COCCINEA. N. G. of Mexican Shrub, from Bartram's Garden.

The Botanical Garden of Bartram received some years ago from Mr. Poinsett our ambassador in Mexico, a fine new green-house shrub, akin to *Euphorbia*, with splendid scarlet blossoms, or rather bracts. It has since been spread in our gardens near Philadelphia, and is known in some as the *Euphorbia Poinseti;* but appears to me to form a peculiar genus or S. G. at least, by the singular lateral mellifluous gland of the Perianthe. It is a fine showy plant, well deserving cultivation; it gives out a white milk like the rest, but the gland exudes a yellow sweet juice.

G. PLEURADENA Raf: Perianthe colored thick sub 8 lobe, on one side is a very large elliptical gland, perforate and mellifluous. Phoranthe wooly, stamens incluse subulate, anthers flat bilocular. Gynophore elongate pendulous, 3 bifid styles, capsule smooth tricocous— *Habit* Shrubby, leaves scattered petiolate, umbel depressed corymbose, surrounded by many large colored bracts.

Sp. *Pl. coccinea.* Raf. Inerme, leaves ovate subangular acute remote, umbel irregular, bracts scarlet lanceolate acute. Flowers subsessile yellow edged with red, gland yellow, blossoms very early in Spring.

If yet deemed an *Euphorbia* it may be called *E. coccinea* or E. *poinseti* Raf. S. G. *Pleuradena.*

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138. OROSPODIAS CORYMBOSA or WILD CHERRY, of Oregon Mountains.

At page 78 of this Journal this New Cherry tree was described and called *Prunus rotundifolia.* Upon a second examination of two trees of it in Washington square when in full bloom at the end of April, I have ascertained that it ought to form a peculiar G. or S. G. between *Padus & Cerasus,* which I therefore call *Orospodias* meaning Mountain Cherry. It differs from both by *flowers in a corymb* or short corymbose raceme rather than fascicle, with bracts at the base. The Calix is campanulate 5 fid, with acute reflex segments. Petals unequal oblong obtuse. If this tree is to be retained with *Prunus* it might be called *Pr. corymbosa,* this name being better than *Pr. rotundifolia,* as all the leaves are not round, but some oval, while the flowers are always corymbose, larger than in *Padus,* but smaller than in *Cerasus.* It differs totally from *Cerasus* by not having the *Calix urceolate,* a striking character of *Cerasus,* omitted by all the authors! altho' it is the best distinction between it and *Prunus.*

INCOMBUSTIBLE ARCHITECTURE,

Or Fire Proof Buildings of all Kinds,

BUILT AS CHEAP

AS ANY COMBUSTIBLE BUILDINGS.

BY C. S. RAFINESQUE,

Professor of many Sciences, Architect, Draftsman, &c.

The constant deplorable loss of property and lives by the conflagration of public and private buildings, and even whole towns all over the United States, calls loudly for a remedy or a change in our style of building.

This remedy is found, and the only objection to a change by the greater expense of fire-proof buildings will be obviated by the discovery that such buildings may be constructed on a new plan quite as cheap as any other common stone and brick buildings. Therefore this new style of *Incombustible Architecture* ought to be immediately adopted for all our new buildings.

Several additional advantages are connected with this new style of Architecture, such as enabling to warm the buildings at one third the usual expense, and to insure them for a mere trifle. Nay, these additional inducements are of such importance that they might of themselves decide to employ this new way of building. At any rate, I am ready to contract to build any edifice or house, for the payment of the saving in fuel and insurance, besides the actual cost in the usual style.

Let us reflect that ever since 1800, the United States have suffered a loss of fifty millions of dollars at least by conflagrations, besides several thousands of lives lost also; with many millions for wasted fuel, insurances against fire, keeping engines, hoses, and firemen.

Let us reflect that all our colleges, libraries, museums, public offices, stores, factories, theatres, &c. are yet liable to be destroyed, with all their contents, records, books, wares, machinery, &c. and judging from what has already happened, they are *all doomed* to be burnt down in succession, and the contents lost.

To render the actual public buildings and houses incombustible may also be accomplished. All the scientific attempts to render wood altogether incombustible in a very great conflagration, have been unavailing, since even bricks will crumble by excessive heat. But my new style of architecture may be partly adapted to actual buildings, so as to render them less liable to conflagrations, and enable them to realize a saving in fuel and insurance that will pay for the extra expense. This I will also undertake to do, by specific contracts.

But it is in the new edifices yearly erecting over all the States, that my new method may be easily and cheaply applied. Thus I will undertake to build or direct the building of new

STATE HOUSES	CHURCHES	ARSENALS
COURT HOUSES	MEETING HOUSES	BANKS
PUBLIC OFFICES	LIBRARIES	WAREHOUSES
COLLEGES	MUSEUMS	HOTELS
ACADEMIES	THEATRES	HALLS
MANUFACTORIES	PRIVATE HOUSES	FACTORIES,

All over the United States, AS CHEAP if not *cheaper* than they would cost, if built in the usual combustible way. And I will insure them when built for 2 or 3 mills in the Dollar per annum, or for one Dollar in 500.

Such buildings will be altogether incombustible, even if the furniture and firewood was set on fire on purpose, and in time of war cannot be destroyed by an enemy unless blown up with gunpowder.

They will be just like any other Houses and Buildings outside, but a little different inside, yet more elegant, simple and convenient. The whole may be or may not be vaulted as required. Nay by some trifling changes in the plan and design of any building, it may acquire this incombustible property.

They will be built by myself as Architect and builder upon the device and estimates of any other Architect. Or if employed as chief Architect, I will enable the builders to perform the needful work inside as cheap.

My terms will be similar to those of other Architects.

I will charge 5 to 10 per cent and travelling expenses if employed as chief architect, but nothing for drafts and estimates. Of this 2 per cent must be paid in advance.

If employed as builder I will build at the same rate as any other builder would for combustible (stone or brick) houses, receiving for remuneration the saving in fuel and insurance for 25 years, one fifth in advance.

To alter any standing house or building and give it this incombustible property, I will charge the actual needful expences to change the inside and roof with the saving in fuel and insurance for 10 years, 2 years in advance, or half of the saving for 25 years.

I have not taken a patent for this discovery, because our actual patent laws give no security against vexatious law suits and heavy expenses, while by keeping secret a discovery it may be made more profitable. This I have found by experience. The difficulty of making models would also be too great. But I will use this discovery as Macadam used his roadmaking in England, and I will teach the art to any architect or builder for $ 1000.

Apply personally or by letter to *C. S. Rafinesque*, Architect, &c. No. 59 North 8th Street, Philadelphia. Letters ought to be post paid unless enclosing remittances. I will not answer any letter asking idle questions; unless a fee is sent; but will immediately attend to orders in the line of this business.

C. S. RAFINESQUE,
Prof. of Hist. & Nat. Sciences.

Philadelphia, 1833.

Directions how to proceed for Applications.

Any house owner who wishes to render his property fire proof, must furnish me with an account or plan of it, with statement of value, fire insurance, age and cost of fuel in it. Whereupon I will furnish the means (or do it myself) to render it incombustible, and at the same time much warmer in Winter and even cooler in Summer.

Those who wish to put up new buildings, public or

private, must furnish a statement of the place, ground, kind of building and what they wish to expend, contemplated size and materials with their cost at the place where it is to be erected. Whereupon if employed as architect I will furnish the needfull plans, elevations and estimates. For which I must be paid as any other architect would be, unless I am allowed a stipulated sum as chief architect, or commission on cost of the whole.

If any other architect has been or is to be employed, he may take all that trouble on himself, I shall merely want a copy of his plans and estimates, whereupon I will state how I can undertake to add the incombustible property by myself or proxy. But no architect is to see my operations nor study my new art unless he pays me, or his employers for him $ 1000.

These Statements ought to be handed to me, or sent me by private conveyance, unless the postage is paid. I recommend to state outside of the letters, *Application for I. A.*

I shall be ready to attend to this business and undertake buildings on the 1st September, 1833. If I receive many distant applications, I will appoint agents whenever it is necessary to attend in person.

RECAPITULATION

Of the warranted advantages of this new style of Architecture.

1. Buildings will be fire proof.
2. They cannot be set on fire on purpose.
3. They cannot catch fire from neighbours.
4. They will last longer.
5. They can be warmed in Winter at 1-3d the actual cost.
6. They will be insured at a mere trifle.
7. They will be warmer in Winter.
8. They will be cooler in Summer.
9. They will require no expense of fire engines and firemen.
10. They will save the lives of 100,000 persons doomed to be burnt alive.
11. They will save 100 millions of dollars of property doomed to be burnt.
12. They will look neater and more convenient inside with more space, &c. &c.

And all this may be done AS CHEAP or cheaper!!!

Nr. 7.

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WITH FIGURES.

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Professor of Historical and Natural Sciences, Member of many learned Societies in America and Europe, Author of many Works, &c. &c.

Knowledge is the mental food of man.

VOL. I. PHILADELPHIA, AUTUMN OF 1833. No. 7.

Article 140.

SCIENTIFIC TRAVELS OF C. S. RAFINESQUE, IN 1833.

My first journey this Spring was to the Pine barrens and Marl pits of New Jersey, I had a pit opened at my expense, and collected there many fine fossils, some of which are new.

The second was in the Southern States. I meant to follow the Apalachian Mts. to the Unaka Mts. of N. Carolina and Tennessee; but was prevented by the rains and an accident: I explored however, the Mts. Cotocton of Virginia and Maryland, which to my great surprise, I found divided into three ranges or ridges, uniting into one N. of the Potomac with an insulated mt. in front o the E. called the Sugarloaf, 25 miles in circuit. All this is omitted in our maps. I brought many plants, and some N. sp.

My third excursion was on the Schuylkill, from the mouth up Manayunk and Spring-mill.

In July I took a fourth journey to the Pine barrens of N. Jersey, and the litoral islands of the sea shore at Manahawkin and Long beach island, where I collected many shells and plants with an N. G. *Ygramela maritima.*

My fifth journey was in the mts. of New-York, after giving some lectures in Troy and exploring the Bald mountain E. of Lansingburgh 1030 feet high, I went on a kind of scientific pilgrimage to the sources of the rivers Delaware and Susquehannah, sites of great interest and yet where no Philadelphian had ever gone to explore nature. I found the physical geography of that region totally neglected by our map makers. I explored the Heidelberg mts. or rather that table-land of 1200 to 1500 feet, the Schorarie or Skohary mts. the Oquago mts. 3000 to 3600 feet high, which are the western side of the Kiskatom or

Catskill mts. The Delaware springs from Lake Uts. antha 2000 feet above the sea, and the Susquehannah 40 miles distant from Lake Otsego 1200 feet high. I visited the Rattle Snake hills, Otsego hills, Brimstone falls 150 feet high, &c. This region is a table-land, western continuation of the Heidelberg, and which is twice cut through by the river Mohawk. I have brought from thence a fine collection of fossils, plants &c., some N. sp. many views &c.

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141. PHYSICAL GEOGRAPHY. *Elevations of land and water, mountains and hills in the State of New York.*

The singular configuration of this state has but lately been noticed, when surveys were made for the canals and roads. In 1829, Joseph Henry read before the Albany Institute his topographical sketch of N. Y. which is published with a very uncouth section from East to West, and he has omitted the North and East of the state. The geological sections of Prof. Eaton do not attempt to connect them with Physical Geography by graduated scales. All the map-makers took no notice of the mts. and table-lands of this state, until David Burr who in 1832 has at last delineated in part the N. Alleghanies and some other mts. of this state in his small map, reduced from the large or county maps, wherein most of these mts. *are omitted again, being mere flat surveys.* It was also in 1832 that I drew those mts. in Tanners new map. My labor and Burr's being contemporaneous and both original, may mutually correct each other. Mine is by no means perfect not having visited the whole state; he had better materials and opportunities, yet he is defective in the Catskill and Macomb mts. he lacks the Oquago mts. and all those between Troy and Lake Champlain, &c.

Having procured during my late journey in that state many additional materials, I shall now condense the whole in a general view. The following abbreviations will be used, H. for Henry, C. for W. Campbell, surveyor mpt. P. for Captain Partridge, S. for Spafford, R. for Rafinesque.

This state may be deemed divided into 6 parts, 3 level and 3 lofty. 1. Long Island nearly level and belonging to the great atlantic clysmian formation extending hence to Florida. This island with Staten Island, Manhattan, &c., are properly the Delta of the R. Hudson; but Staten Island has primitive hills and is not clysmian. Manhatan is partly so.

2. The valley of the Hudson as far as Glen's Falls, and of the Mohawk, united with Lake Champlain, by a level of 147 feet. These valleys average from 200 to 500 feet. It is evident that when the sea was 150 feet higher it must have joined these valleys by a

streight, and all E. of it must have been a large island.

3. The plains along Lake Ontario and the R. St. Lawrence, which average from 300 to 500 feet also, but are of a different nature, mostly organic and limy.

Those 3 level tracts divide the other 3 high regions or table-lands of the state.

4. The Taconic or Taghkanik region to the East, a range of mts. running N. and S. but at the end turning W. to form the Manhattan highlands.

5. The Alleghany Region, the largest of all, forming a table-land 360 miles wide in the S. of the state, and of organic formation.

6. The Saranac Region, to the North, primitive like the Taconic. L. Champlain separates them. It is the least known and explored, but also a table-land.

Yet the whole state lies in the great Lake region of North America, extending from N. England to Alaska. It is filled with lakes, of which 8 are very large, 20 of middle size, and the small ones are innumerable, perhaps 2000. A single county that of Delaware has 50, another 100. They extend even to Long Island. I will therefore begin with those lakes.

The 3 Great Lakes.

1. Lake Champlain lowest, 93 feet above sea at head, 90 at N. end.

2. Lake Ontario 232 feet, S.

3. L. Erie highest 565 feet, S.

The Lakes of the Alleghany.

1. L. Otsego, head of river Susquehanah 1200 feet, R. 1193, H.

2. L. Utsyantha small, head of Delaware 2000 feet, R.

3. L. Chatauque, head of Alleghany R. 1291 feet, H.

4. The two lakes on Catskill mts. 2200, R.

5. Fish Lake 1715 feet, H.

6. Cataraugus L. 1665, H.

7. Beaver L. 1704, H.

8. Lime L. 1623, H.

9. Crooked L. 718, H.

10. Canandaigua 668, H.

11. Seneca L. 447, H. 455, C.

12. Cayuga L. 387, H. 415, C.

13. Skeneateles L. 752, H.

These 5 last lakes are on the N. slope of the Alleghany.

14. Tully Lakes, 1194, H.

The lakes of the 3 low regions have no great elevation, except Oneida, 375, and Onondagua 361. Cross L. 370, H. Those of the Taconic region are all small. Those of the Saranac region are numberless but unmeasured, except Lake George 336 feet, P. those at the head of R. Saranac and Hudson are about 1000 feet.

1. *Region, Insular*, highest hills.

Hempstead hills L. Id. 319, P.

Tompkins hill, Staten Island 307, P.

Closter mt. Manhattan Id. 539, P.

2. *Region of Hudson Valley.*

Capitol of Albany 150, H. 126, C. West Point 188, P.

Kingston 198, H. 196, C.

Warwasing 811, C.

Bald Mountain 1030, R.

Haverstraw mt. 852, P.

Level between the Hudson and L. Champlain 147, H.

Utica and long level 425, H.

3. *Region of Ontario L.*

Ogdensburg 226, H.

Outlet of Onondago L 361 H

Rochester at the Falls of Genessee R. 506.

Base of Niagara Falls 338 H

Top of the said Falls 502, H

4. *Region of Taconic and Mattawan Mts*

1. Saddle mt. highest T. 2915, P.

2. Peterboro mt. T 1864, P.

3. Mt. Anthony 1853 P. in T.

4. Williams College 686, P. in T.

5. Sachem mt or New Beacon, highest of M. 1585, P.

6. Butter hill M. 1529, P.

7. Bull hill M. 1484, P.

8. Old Beacon M. 1471, P.

9. Fort Putnam M. 598, P. The highest mt of this range is in Vermont, E. of L Champlain. Mansfield mt. 4280, P.

5. *Region, Northern or of Saranac*

1. Average of the table-land 800 to 1200 feet, R. at Boonsville 1135, H.

2. Whiteface mt. highest 2686, H.

3. Giant of the valley 1700, S.

4. Mt. Defiance on L. Champlain 813, P.

6th. *Region, Alleghany Mts.*

1. Average of the central table-land 1500 to 2000, R.

2. Average of the Western table-land 1365 to 1565, S.

3. Average of the Eastern table-land 1200 to 1500, R

4. Average of the Northern apron 600 to 800, R.

5. Highest summit between valleys of Delaware and Susquehannah 2440, R. River Gap 2143, C.

6 Ditto between Susq. and Allghany Rivers 2135, C.

7. Labagat Peak highest of Catskill mts. 3814, P.

8. High Peak next highest, 3718, P.

9. Pine Orchard in C. 2214, P. hills near it 2544 R.

10. Oquago mts. W. side of C. highest 3600, R.

11. Hills around Utsyantha L. 2560, R.

12. L. Otsego hills 1715, C.

13. Village of Cherry valley 1336, C.

14. Skohari mts. 1978, C.

15. Mts. between Seneca and Cayuga L. 1256, C.

16. Angelica on Genessee R. 1428, C.

17. Mts. of Genessee valley 2062, C. 2415, C.

18. Isua mts. at head Alleghany River 2135, C. 2350, C.

19. Delhi on the R. Delaware 1385, C.

20. Unadilla R. and village 1015, C.

21. Seneca mts. W. of Seneca L. 1644, C.

22. Heidelberg mts. N. apron of Catskill, table-land average 1200, R. Highest hill near Black Lakes 1510, R.

23. Stamford 1 mile below Utsyantha L. 1880, C. 1887, H.

24. Chemung gap between Seneca L. and Chemung River, 890, H.

25. Marshy summit level between Genessee R. and Alleghany R. 1486, H.

26. Mongap mts, or S Kiskatom near Pennsylv. line 2080.
C Kiskatom or Kiskanom true name of Catskill mts.
27. Shawangunk mountains, between Kiskatom and Mattawan 1668, C.
28. Conewango mts. E. of Chatauque L. 1966, H.

C. S. RAFINESQUE.

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142. GEOLOGY.

Some essential views of Geology, by Dr. Hibbert and Rafinesque.

The following facts and principles are chiefly taken from the excellent Essay on Stratification, by Dr. Samuel Hibbert (Edinburg, 1822), who has by actual observations in Scotland the Shetlands and Orcades, entirely overthrown the fanciful theory of regular primitive strata, made out in Saxony for the whole world by Werner.

Every general theory in Geology (and many other sciences of facts), is thus gradually destroyed by careful and impartial observers. All the greatest discoveries in Geology are commonly performed by them, and those who neither belong to systematic schools, nor to learned academies, so often tenacious of learned errors. Thus it was Palissy (a potter), who in the 16th century first noticed and declared that fossils were organic remains, and not sports of nature as then believed: his opinion was laughed at for 100 years by the learned, and even by Voltaire long after, and yet it was the truth.

It was Lehman who first observed the succession of rocks, and called them primitive, secondary, alluvial, volcanic and basaltic, long before Werner. It was a plain surveyor who first ascertained the succession of English rocks, and made a geological map of England, without any assistance from the learned.

It was Hutton in Brittain, Spallanzani in Italy and Patrin in France, all geological observers, unconnected with the prevalent schools, who first noticed properly the general and extensive operation of volcanic agency, which now begin to be partly acknowledged, in spite of the Wernerian school and other learned theories of sedentary teachers.

I was myself once a Wernerian; but as soon as I could observe for myself, and study rocks, strata, mountains and volcanoes, not in books and cabinets, but where they stand and display their phenomena, I became an enquirer, in search of facts and truth, instead of supports for a favorite theory. At present the greatest foes of free enquiry, geological truth, and the progress of science, are those theorists, who bow to names and merely study the dogmatic books of their idols and sect, or at best mere cabinet specimens.

With this pre-understanding I shall now give a concise analysis of the important views of Hibbert, with some notes of my own.

I. The truths established by the great astronomer Laplace, upon the theory of the earth, are chiefly, 1. That the earth was probably formed by a concretion of gaseous matter, being apart of the solar atmosphere, (or a nebulous *akash* or ether.)

2. The whole earth has once been fluid.

3. The figure of the surface of the globe, is a little different from a true fluid sphere.

4. The mean density of the earth is 4867, water being 1000

5. The density of mountains vary from 2000 to 4500.

6. The density of the strata increase from the surface, to the centre of gravity of the globe.

7. Strata are very nearly regularly disposed around this centre of gravity.

8. But nothing proves that they are quite concentric.

9. The irregularities of the surface have little depth.

10. The depth of the sea is only a small fraction.

Both the Wernerians and Huttonians begin to admit these facts and demonstrable truths. (A.)

II. Primitive rocks so far from being concentric to the globe are merely local like the others. 1. In Cornwall, Scotland and Shetland *the granit shoots into other strata!* imbedding them, or being imbedded by them.

2. All the kinds of primitive rocks are found in the Shetland islands, *intermixed* or *ever running into each other!* forming veins, interstrata and inter-masses. Even masses of granit and veins traverse the limestone! Such are granit, gneiss, sienite, porphiry, clay slate, serpentine, mica slate, hornblende, quartz, chlorite, limestone, sandstone, &c. (B.)

3. All vertical sections of land are therefore erroneous when uniting theoretical views, and invisible connections of strata. Horizontal plans can only be proved by evidence of limits. (C.).

4. Certain intervals of cessation have occurred during the formation of terrestrial matter.

5. During these intervals the surface of the globe has become the habitation of certain tribes of animals and plants.

6. These organized beings have become extinct by the successive investments of new strata deposited by a fluid. (D.)

7. Several secondary strata merely differ from the primitive by imbedding organic remains. (E.)

8. Volcanic strata have some peculiar rocks, but at the same time nearly all the primitive and secondary series.

9. The geysers or hot volcanic springs, emit thermal rocks resembling basalt, wacks, amygdaloid, porphiry, tuffa, and even obsidian! (F.)

10. Therefore such rocky strata, often deemed primitive, secondary or anomalous, may have been of volcanic origin. (G.)

III. The following are the order of organic strata and

relics, from the lowest to the highest.

1. *Oldest or lowest.* With coal traces of vegetation and a few marine animals. (H.)

2. *Cubical limestone.* With extinct encrinites. (I.)

3. *Lias.* With ammonites, trigonites, pentacrinites, &c.

4. *Sandstone* and *Grit.* With belemnites, ammonites, trigonites, &c.

5. *Soft Chalk.* With the same.

6. *Hard Chalk.* Scaphites, oval ammonites.

7. *Sand* and *Blue Clay.* Many shells not found in older strata, some yet living.

8. *Gravel.* With recent shells and land animals.

9. *Gypsum.* Extinct quadrupeds and birds.

10. *Diluvion* and *Alluvion.* Living quadrupeds and men.

IV. The chemical ingredients of rocks are of great importance in distinguishing them. Although liable to some variety and anomaly, the principal series appear to agree in chemical composition.

1. The primary rocks are distinguished by the presence of magnesia and potash.

2. The organic rocks by their absence, but the presence of gypsum and excess of lime.

3. The volcanic by the presence of soda and iron.

4. The average ingredients of 7 series of important rocks, are as follows.

Primary Series, chiefly granit. Silex 60, lime 8, alumine 16, magnesia 6, potash 4, iron 2, adventitious 4 parts out of 100.

Primary transition. Silex 58, lime 16, alumine 14, magnesia 2, potash 2, adventitious iron, gypsum, bitumen, &c. 8.

Secondary. Silex 56, lime 24, alumine 12, adventitious, gypsum, salt, iron, &c. 8.

Tertiary. Silex 52, lime 32, alumine 10, adventitious gypsum, &c. 6.

Volcanic Lava. Silex 72, lime 2, alumine 10, potash 4, soda 2, iron 4, adventitious 6.

Phonolite or *Clinkstone.* Silex 60, lime 2, alumine 24, soda 8, iron 2, adventitious 4.

Basalt. Silex 48, lime 8, alumine 8, iron 18, soda 4, adventitious 4. (J.)

V. The natural ingredients of rocks and strata: or successive arrangement of their matter, may be comprized under 6 series.

1st Series. *Molecules.* They are the chemical ingredients enumerated above.

2d Series. *Particles* or *granular parts.* They are of 4 kinds, 1. crystaline, 2. porphyritic, 3. coherent or granitic and semi crystaline, 4. arenaceous.

3d Series. *Concretions.* Of 8 kinds, 1. crystaline, 2. porphyritic or cristaliferous, 3. semi crystaline, 4. concentrical laminar, 5. amygdaloid, 6. irregular as in verd antique, 7. fragmentary or conglomerate, 8. organic, containing imbedded organic remains.

4th Series. *Masses* or *Massive portions.* Of 9 kinds, according to structure, 1. lami-

nar, 2. lamellar, 3. foliated, 4. schistose, 5. slaty, 6. tabular, 7. stratified, which are parallel, promiscuous or partial, 8. beds or spreading masses, 9. angular or polyedrous, with 3 to 6 angles and sides, and either columnar or bent or curved, distorted, with concretions, &c.

5th Series. *Veins*. Of 3 kinds by size, 1. filamentose, 2. radicose, 3. dykes or huge veins. But of 6 kinds by directions, 1. interposed, 2. intercurrent, 3. intersecting, 4. insulated, 5. connected, 6. branched.

6th Series. *Mountain masses*. Of 5 kinds, 1. homogenous, 2. venigenous, 3. aggregate, 4. stratified, 5. unstratified. (K.)

Notes by C. S. H.

A. These views although partly astronomical and geogonical are perhaps the base of geology They need no comment. Those who have adopted a different view of geogony will not assent perhaps; but if they bow to names those of Laplace, Herschell, Lasalle, Lamethrie, Patrin, Hibbert, and fifty other geologists of note, may have some weight. Although liable to controversy like all remote agencies, they have intrinsic plausibility, and agree with all the known phenomena.

B. These important facts of the intermixture of strata, may be verified in some way or other by all careful observers. I have seen them both in Europe and America, and not merely in the primitive as Hibbert, but in all the other series, Transition, Secondary, Tertiary and Volcanic! I have seen strata running into each other or penetrating their neighbours in Sicily, Ohio, Kentucky, and the Alleghanies. Prof. Eaton has observed something alike in the strata which he has called Cuneiform. This is a curious subject, not yet well understood by geologists, and requiring more explanation than I can now give. It is evident that new strata may fill vacuities and clefts in older strata, and that volcanic (or impelled) streams of stony matter can penetrate softer strata.

It is probable that not a single stratum is concentric to the whole earth, but all strata are local, superposed or annexed or intermingled.

C. All our geological maps and sections are at present caricatures, deficient in proportions and details. The best map can only show the superficial stratum, and sections are more the offspring of fancy than truth.

D. But this fluid was not the actual sea as commonly supposed, it must have been the waters of a part of the ocean filled with emanations either from the atmosphere or submarine eruptions of volcanoes or springs.

E. Except granitic and talcose Rocks, which are specially primitive almost all the others are also found with organic remains.

F. I have long ago, (in 1819) considered springs as *Volcanoes of water*, and volcanoes as *springs of fire*. The analogy is striking, and the volcanic geysers, mud and water eruptions, blend by gradual links with the mineral and hot springs.

6. There is nothing to disprove and much to prove that every mineral substance and stratum, may have been formed or ejected by the agency of volcanic eruptions or

emanations, on the actual surface of the earth: remembering that springs are also volcanoes.

H. These ten series of organic formation are not perfect nor complete: even those of Cuvier are yet deficient, because America, Africa and Asia are not taken into account. I mean soon to give our American series. The oldest series with us is Limy, and holds Porostomes and Tethytes, Terebratulites, Madreporites, Tribolites.

I. This Cubocal Limestone, is perhaps our oldest stratum; but Encrinites do not distinguish it, being found also in newer strata The worthy Hibbert has only stated there his own European knowledge. Our successions of strata in N. America are quite different; we have no chalk, our Gypsum has no animals. Our organic strata appear to be quite different from Europe in mineral characters, and species of fossils; although equivalent tribes and genera are found. But much fewer Cataclysms or floods than Geologists are now fond of inventing, are needed to explain all these formations. Periodical local paroxysms or Emanations will account as well or better for them.

J. This chemical table of ingredients, is novel and curious, but I am sure will be found to differ in every country, and in each successive analysis. Every peculiar rock has besides mineral ingredients peculiar to itself.

K. This methodic enumeration of natural parts of rocks is very valuable, although liable to some objections and omissions. Veins ought to follow concretions and the two series of masses be united. Although mountains may form a peculiar important series, their knowledge forms the new science of Orology. Several kinds of mountains are omitted; the Tabular, Ridged, Peaked, Circular, Branched, Hollow, Knobby, Sloping, &c. are as many different forms: Fragments or boulders, debris, gravel, and sand ought perhaps to form a peculiar series: the Clysmian of Brongniart.

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143. AMERICAN HISTORY.

Some remarks on the Ruins of Otolum near Palenque — By C. S. Rafinesque.

I have postponed my 3d letter on those ruins and the probable language of the inscriptions, to wait for further details and vocabularies from the explorers. There are now 3 explorers of the ruins, Dr. Corroy of Tabasco with whom I have begun a correspondence to procure a chontal vocabulary, Mr. Waldeck a German painter, and Mr. Galindo, a native who has lately sent to the society of Geography of Paris some interesting details.

Mr. Galindo confirms the extent of these wonderful ruins, being 7 Spanish leagues or about thirty English miles in length, Corroy and Waldeck have already surveyed 18 palaces or large buildings, some as large as the Louvre in Paris. The houses are scattered, not compact, and in a deep forest. Their form is quite peculiar, being like galleries with angular roof, and parallel with a yard between, which I take to have been the streets. The stones are cemented and like bricks, 18 inches by 9 and 2

thick, doors small, windows round or square.

A very important remark, if true, is that the actual *Maya* Indians of the neighbourhood have the same features as the sculptures on the ruins. These Indians are called *Chols* or *Puctuncs*, and the wild ones *Lacandones*, both speak dialects of the Maya or language of Yucatan. Galindo thinks that all the L. of Central America are derived from the Maya and that they are the children of the builders of the ruins. But he has omitted to notice the *Chontal* or *Tzendal* nation and language, which I rather consider as such. However the whole country around is filled with ruins of cities and all these nations may have been connected anciently.

On the R. *Tulija*, which means water of TUL near the ruins and navigable, is a stone bridge with arches 500 steps long, and now under water, probably by the filling or raising of the bottom, which would prove a very great antiquity. Galindo mentions also, but without name, the stream running through the ruins, the O-TOL-UM of Delrio, meaning in Maya yet *the first TOL*. *Hum*, and *Hun*, means one in Maya, Chol and Kachiquel, which is identic with the Pelagic and Latin *Hun*, *Unum*, preserved in modern languages, God is called *Hunaku* mg. the first cause.

I have now many words in the Maya dialects taken from Galindo, Baezo, Villagutier, Ayeta, Cordova, Herrera, Gage, Vater, Balbi, &c.—But few as yet from the *Chontal* dialects, such as Quiche, Coban, Quelen, Cerquin, &c. taken from Juarros chiefly. Yet they evince a different language of which I will give a few examples.

	Maya D.	*Chontal D.*
†Men	Vinic	Chon
	Quil	Izen
	Chib	Mazagual
†Ten	Lahu	Chel
†Town } Village }	Cah	Zacu
	Milpera	Paxuyuh
†Lord	Ah	Pira
	Ahau	Ahaos
†Sun	Kinik	Aca
	Kin	Acapu
†Water	Ha	Iha, Iqui
	Bakain	Taleka
Great	Uim	Ca
	Nohoch	Guan
Boat	Chem	Pitpan.

Yet in these 8 words there are 6 having remote analogies which indicate 75 per cent of mutual affinity.

Juarros says that *Chontal* now means Rustic, being applied to the most rude mountaineers; but this name is evidently national and means *eminent men* or *men of the mountains*. Wherefore they are most likely to be the remains of the ancient TOL conquered by the Mayas and driven to the mountains. They are spread in all the mts. of Central America, and their language deserves the utmost attention.

Waldeck has stated that new dialects are now forming in

the Maya, and that every ten years makes a difference, which is almost incredible. But mountaineers are more tenacious of their speech as evinced everywhere. Due allowance must however be made for those constant changes.

144. *History of Austral America.* This will be the title of the first volume of my History of the American Nations now preparing for the press, and in which a new, correct and ample survey will be given of the nations of this continent. I have begun by the most difficult part, Austral America, which being the most remote ought to be peopled by the most ancient nations; yet I have found them closely connected together and with many other Northern and Eastern primitive nations.

This volume will include all the ancient and modern nations dwelling from the Southern tropic to the S. pole, W. of the R. Parana, with their history and tradition from the flood to 1838. These are the nations I have ascertained, reducing all the other tribes to them.

Ancient Nations 1. TALAHET meaning high people or *Hatihet* great people, called now Puelches or Pampas by the Spaniards, whom they have resisted for 300 years. The tribes are Taluets, Aucaes, Divihets, Calchaquis Chechets, Leuvuhets, &c.

2. CUNIS or *Huiliches* meaning South people, the Patagons of geography. Tribes, Cholcheles, Toelchu, Achang, Calilelets, Yacanas, &c. only a branch of Tal[illegible]

3. POYAS or *Caucas*, tribes Poyas, Chonos, Caucahets, Huilians, Keyus, Tinigus or true Patagons, &c.

4. SEKEH or *Chilians*, with many tribes.

5. KAKANA in Andes of S. Peru, tribes, Xauxa, Chancas, Aucas, and Antis. Andoas, &c ancestors of Poyas?

6. GUANAS of Tucuman, Chiriguanas &c.

7. TAOS or Chiquitos of Chaco, &c.

8. MAYAS, tribes, Timbus, Mbayas, Guaycurus, Abipon, Toba, Mocobi, &c.

9. LULE or Vilelas, and Atalalas! &c.

10. Western CUARANIS. The Eastern will be included in the History of Brazil and Paraguay.

Modern Nations. 1. Spanish with tribes and L. Biscayan, Gallician, Catalan, Castillian, and Gitanos, Guachos, Balerians, Canarians, &c.

2. Portuguese, 3. English, 4. Dutch, 5. French, &c.

3. African negroes of many nations.

I hope my friends and the public will not blend this labor of mine, with the numberless compilations on America, full of errors and omissions, that are so often ushered by book-makers here and elsewhere. It will be found different from any previous historical chronicle, based upon all the materials that language, monuments, re-

cords and traditions can afford, so as to be a real NATIONAL HISTORY of North and South America. C. S. R.

145. *Chontal or Tzendal vocabulary.*

I deem it proper to add here my small vocabulary of this language chiefly from Juarros and Cabrera Whereby it will be seen that it belongs to the same cluster of languages as the Maya, as the numbers and the word *Water* will show. This last is nearly the same in all the L. from Mexico to Nicaragua, for instance,

A, AT in Mexican
AT, NA in Quiche
A. NA. HA, AMA in Tzendal
HA in Mam
HA in Uraba
HA in Poconchi and Puctunc
HAA in Maya
MA in Tarasca

I find the Chontal language called also Zeltal, Celtales, Tzendal, and Zental, words of it thirty.

Lord or chief	*Ahu*
Mountain	*Hatex*
Father	*Pa*
River	*Bera*
Fountain	*Mal*
Tyger	*Zagual*
Flying	*Comi*
Year	*Vilbu*
Land	*Tulan, An*
Men	*Chon*
Great	*Ca*
Sun	*Aca*
Temple	*Cue*
Priest	*Papaz, Tapianes*
Sorcerer	*Brahos*
Village	*Pahuyu*
Stone	*Chala, Chay*
Dance	*Huaste*
Holy	*Huatec*
Drum	*Tapana*
Snake	*Chivi*
Heart	*Votan*
King	*Mek*
Coat	*Tzequil*
Spirit	*Nagual*
Place	*Milpa*
Water	*A, ha na, iha*
	Aque
	Amague
1	*U*
3	*Ohx*
10	*Xel.*

Meantime the explorers of the ruins ought to give us a larger vocabulary of the modern Tzendal, and also others of the dialects of the tribes Zoques, Quelenes, Acalas, Mopanes, Chorti, Quiche, Mam, Pocomam, Zutugil, Lencas, &c. which Juarros mentions in the neighbourhood. C. S. R.

146. GYPSIES OF AMERICA.

It is stated by Griscom in his account of the Gypsies in Silliman's journal, that none have reached America. This assertion is not true, since Southey in his History of Brazil positiuely asserts the contrary and states that they are found both in Brazil and Buenos Ayres; not in the cities of course, but in the country where they wander or carry on their petty trades. Most of them were sent there from Spain and Portugal as vagrants, where they are called *gitanos*.

Thus we must add this nation to our list of the modern

American population. Their true name is *Tzingari*, they are native of Hindostan, of the degraded tribes of Parias, conquered by the Hindus or outcasts from them. They are stated to exceed 5 millions yet in Asia, Europe and Africa. In America their number is small, and even less than that of the Jews. C. S. R.

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147. BOTANY, N. G. YGRAMELA AND PELTIMELA.

Ygramela. Calix campanulate, nearly bilabiate 4 fid, upper lip 1 larger segment, lower 3 acute smaller segments. Corolla campanulate subequal 5 lobed, 2 upper lobes erect, 3 lower spreading, stamens 2, filaments slender, anthers didymous. Pistil with oval ovary, style short, stigma bilobate Cupsul bivalve unilocular, receptacle central large, bearing many small seeds—Leaves radical, scapes uniflore.

Y. maritima Raf. leaves filiform obtuse smooth, several scapes shorter than leaves, plants cespitose.

A small plant discovered this year in the wet sand in the sea islands of New Jersey, whence the name meaning *moist sand*. It has the habit of *Limosella*, but forms a compact short turf one inch high. Flowers in July of a bluish white colour. If some Botanists will unite it to *Limosella*, although it has 2 stamens instead of 4, they may call it *L. maritima*, but then they must unite *Lycopus* to *Mentha*, which differs in no otherwise, and so on with 50 other diandrous genera.

Yet we find some botanists have already united to *Limosella*, 3 species with 2 stamens L. *Silesiaca*, L *capensis* and L. *diandra*, all of which differ more or less besides. I suspect that the 2 first belong to my G. *Ygramelta* by having a 4 fid. calix instead of 5 fid. If they do not they must form a peculia G. *Mutafinia* Raf. As to L *diandra* it is a very distinct G. by Wildenow account and I call it

PELTIMELA (meaning small peltated stigma), calix tridentate, corolla quadriparted, style incurved, stigma peltate, 2 stamens. How could this be united to *Limosella* with cal. 5 fid. cor. 5 fid. 4 stamens, &c.?

P. *cuneata* Raf. leaves linear cuneate, scapes equal—native of India. C. S. R.

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148. *On the Custard-apples or Anona triloba and glabra.*

Linneus has two Sp. under those names as natives of N. America and he quotes 2 figures of Catesby as references. Yet our worshippers of Linneus have dared to overlook this, and deem them both only one, which they call commonly *A. triloba*. Both are however in Bartram's garden and I have seen them frequently. As the leaves are nearly alike, and the flowers and fruits which afford the best characters are seen but rarely, the flowers besides in early spring before

the leaves come out, the mistake may be accounted for, but not the disrespect for the idol.

The *A. glabra* is a large tree, with black purple flowers and a fruit as large as a cucumber; it grows in the South and West from Ohio to Georgia. Fruit very good and worthy cultivation.

While the *A. tribola* is only a large shrub has green flowers and a fruit one fourth the size only of the last. It grows from Pennsylvania to Virginia.

Bartram discovered in Georgia and Florida 3 other shrubby sp. with small fruits. All these now belong to the Genus *Asimina* of Adanson 1763, which other botanists attempted to change into *Orchidocarpon* and *Porcelia*, but Duval and Decandole have restored the oldest good name of Adanson, derived from the native name in Louisiana of Asiminier.

There are perhaps other sp. in the West, I have seen one with rough seeds, but I am not prepared to distinguish it properly. I refer our lazy botanists to Linneus and Catesby for the striking characters of *A. glabra* and *triloba*. Eaton has both, but he leaves *A. glabra* into the genus *Annona*, while I aver, having both before me in fruit, that it is a real *Asimina*, having the fruits transversally multilocular, seeds arilla e, and only one stigma to each fruit, which mostly abort except one in a flower, just as in *A. tribola*.

C. S. Rafinesque.

149. Ecpexis.

N. G. of Water Plants.

A very singular water plant, one of the simplest in nature, is found in the river Schuylkill and even in the hydrant water from it. When allowed to stand a week in warm weather, a kind of diaphanous gelatinous film forms itself on the top of it, which gradually increases downwards and fills the vessel holding it, as if the whole water was congealing; but when the water is all changed in this transparent jelly, it begins to dry up, and the whole by degrees becomes a mere thin transparent membrane suspended above. I have repeatedly noticed and watched this vegetable production, which must be produced by invisible germs in the water, and is very akin to *Nostoc* and other simple water *Tremellas*. I give it the name of *Ecpexis* meaning congelated film.

Ecpexis, N. G. Raf. Floating on water, solid, gelatinous, transparent, without any appearance of organs.

E. fluviatilis Raf. Amorphous, flattened, smooth, uncolored. From 2 to 10 inches or more, unequally circular, but it is so hard to be seen out of vessels that I could not watch its form in the river. It appears to increase downwards by the successive formation of a simple cellular jelly. C.S.R.

150. *Substitutes for Tobacco.*

We have borrowed from the Indians the filthy and vicious

custom of smoking, or inhaling the hot vapor of a pernicious weed, a narcotic poison. We ought at least to borrow from them the mode of making Tobacco milder and less pernicious, and above all fragrant instead of stinking: they seldom smoke pure tobacco, but always mix it with fragrant or milder substances.

Whoever smokes pure tobacco habitually, is a selfish vicious man, particularly if he throws the stinking smoke into the lungs of whoever chances to be near him; which no one has a right to do as it is a real nuisance, as much so as if a man was to throw dust or brimstone smoke into the noses of his neighbors.

Therefore let them adopt at least fragrant tobacco, the tobacconists who will devise and introduce them will probably make fortunes and deserve well of mankind, as it will lessen the evil done to themselves and to others by smokers. Fragrant cigars might thus be made better than Havana. Those are made fragrant by the leaves of *Piqueria* or of *Liatris odoratissima*.

Here is a recipe for making Fragrant Tobacco for the pipe such as used by the Indians of Canada, 1-3d tobacco leaves, one third leaves of red willow, *Salix purpurea*, and one third shumac leaves.

The leaves of the sweet gum or Liquid-amber, make a very fragrant tobacco by themselves or mixt, and they can be rolled in cigars. Many other leaves are equally good, such as sweet fern, wintergreen, and many more which I shall indicate if any disposition is evinced to leave off the strong stinking tobacco. This fragrant substitute could be afforded so cheap that the present smokers would no longer be compelled to smoke coarse, rank cigars.

C. S. R.

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151. *Huge Water Volcano.*

One of the highest volcano throwing water instead of fire, is found near Guatimala. It is a perfect cone 14,500 feet high and 72 miles in circuit. Dunn who ascended it in 1828 says that the crater which once threw a flood of water, is a rocky concave hollow, only 140 by 120 yards; it has now mosses and grasses in it. The Spanish call it *Volcan de Agua* or water volcano. The Indian village of S. Maria is 7500 ft. high on it. It is divided in 4 regions. 1. Cultivated or tropical till 9000 feet. 2. Woody region or forest of oaks, with canes and the rare tree *Cheirostemon*. 3. Naked region of grasses. 4. Of scrubby Pines crowning the top, where there is a sublime and extensive view, the two oceans Atlantic and Pacific can be seen from it. The thermometer stood at 42 deg. when it was 72 degrees at the base.

It was called *U-hatez-mal-ha* by the Chontals, meaning *the mountain throwing water*, and has thus been known as such

very anciently, since it has given the name to the country and cities of Guatimala. The old city of that name near it, has often been destroyed by it, and the fire volcano of Alotenango, which last eruption was in 1826.

Let geologists explain what difference there is between this huge spring of water, and other periodical springs of smaller size. C. S. R.

152. *Improvements in Navigation.*

They are always very slow by the force of habit and fear of innovation. Let us remember how long it has taken from the introduction of rafts to that of steamboats. Even steamboats were invented three centuries before they were adopted. But now the march of improvement is more rapid. It is now requisite to build steamboats that will be incombustible and can never catch fire, 2d, that may never sink even when striking against snags, rocks, &c. 3d, that never will burst their boilers. All these 3 requisites, which every one should think indispensable to secure lives and property, are either known or in a fair way to be dicovered ere long. But will the owners and builders of these boats adopt such improvements? Perhaps not, they are intent only on speed, and insuring do not care for wanton losses of lives! But the public must call for and demand these safe improvements, by neglecting those who sport with life.

Yes, let it be known that I and others know how to prevent any boat from ever sinking, and from burning or catching fire, and I am ready to impart the information or sell the articles required for the purpose.

C. S. Rafinesque.

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1. ANTIGNIS,

Or Incombustible Varnish, and Paint of any required color, to prevent houses and ships from catching fire and burning. Any quantity supplied by contract at one dollar the pound, in solid cakes.—Apply by letter post paid.

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Nr. 8.

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154. METEOROLOGY.

The Luminous Meteors of 1833.

By C. S. Rafinesque.

On the night of the 12 to 13 November, 1833, a wonderful display of meteors was visible all over N. America, which has excited the curiosity of the learned and unlearned, alarmed the superstitious, and baffled their inquiries.

Before any correct explanation is attempted, it would be needful to wait for the accounts from all parts of the world; this has prevented me from venturing to write on the subject in the newspapers.

We know already that it was visible from Canada to Jamaica and California; but attended with different circumstances, although simultaneous every where. It may have been visible also in Europe and in China, or at least, wherever it was night.

Shooting stars and flying stars, are a common phenomenon at night, particularly in volcanic countries; they are probably as common in the day time, but unseen. The meteors of November (which have again appeared partly in some nights of Nov. and Dec.) were not the same thing, being compared to a shower of fire-works, falling rockets, and luminous snakes; clouds, suns and streams of fire, diverging from a circle in the Atlantic Ocean towards the horizon all around on our Atlantic shores; and in California as directed towards the North.

It will be needful for whoever will attempt a rational explanation of this phenomenon, to have before him the accounts from all parts of the world, and to compare them carefully as to time, directions, and appearances. If unseen where it was daylight, it does not follow that the meteors did not exist there also, but they may have been hidden by the solar light.

It will be needful to ascertain

1. If the meteors were above the clouds or beneath them, if any reached the ground, where and how? Common shooting stars reach the ground in oblique phosphoric streams.

2. How high was the region where they started, or where some exploded? this may be ascertained by angles.

3. Was their light phosphoric, electrical or enflamed?

4. Did not their general motion move contrary to the earth's actual motion at the time?

5. Was the whole a sidereal or an atmospheric phenomenon? Did it begin out or at the contact of the atmosphere?

After this we must discuss what connection there may be between these meteors and the aurora borealis, 2d comets, 3 electricity, 4 the hydrogene of the atmosphere, 5 volcanic emanations, 6 aerolites and bolides, 7 other luminous meteors trabes, zodiacal lights, &c. 8 common flying stars, &c.

Therefore, correct scientific explanations will not be easy nor speedy. Whatever may be said or conjectured, without reference to these needful enquiries, will be mere conjecture and vain theories.

The following facts may be stated as ascertained already:

1. They were not similar to common flying stars.

2. They were seen at 4000 miles distance, N. and S., E. and W. or occupied that immense space.

3. Many meteors were commingled, some exploded with noise, others did not.

4. The general motion was radiating from a circle in the Atlantic Ocean.

5. No Aerolites fell or was seen to fall.

6. The aurora borealis appeared along with them on Lake Erie or towards the N. W.

7. They extended chiefly over the northern hemisphere of the earth.

8. They did not set fire to any thing, like thunder bolts and bolides.

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155. BOTANY.

Chronological Index of the principal Botanical Works and Discoveries published by C. S. Rafinesque.

Some botanical writers have been loath or prevented to render justice to my botanical labors and discoveries since 1802; they pretend that they do not know all my works; yet when they know them they often neglect them. Idleness or jealousy would be a better pretext. Some European botanists, and Decandolle, the first among them, have done me better justice.

I will give here a complete index of nearly all my publications on Botany, chiefly on N. American plants, in order of time, which settles the right to discoveries and improvements. They are mostly to be obtained from me, and are embodied in my *Amenities of Nature*, or

collection of my tracts and essays. My N. American botanical discoveries will also be recapitulated in my *Additional Flora of N. America.*

This index does not contain my works on Zoology and Animals, nor some few botanical tracts, of which I have been deprived by shipwreck.

Few botanists have so long cultivated and improved the science, since I began in N. America in 1802, and I find my zeal unabated after above 30 years of exertions. My labors will be duly appreciated in time, as those of Adanson of 1763 and Necker of 1790, so long neglected by systematic rivals, begin at last to be, after 70 years and 40 years delay!

1804. Floras of Delaware and District of Columbia, my first essay, suppressed by Dr. Benjamin Barton.

1804. Botanical letters to Muhlenberg, Brickell, &c.

1805. Discoveries in North America, Leghorn.

1807. Panphysis Sicula, Prodromus, Palermo, 4to. fig.

1808. N. Genera 10 and 60 N. Sp. of American plants in No. 44 of Medical Repository—re-printed in Desvaux' Journal of Botany, Paris, 1809, and in Archives of Discoveries. Observations on American Botany in ditto.—Icones Nov. Panarum Americ. 40 pl.

1810. New animals and plants of Sicily, 1 vol. 4to. with 78 fig. Palermo.

Monograph of the G. Bertolonia.

1811. Naturalized plants of the United States, in No. 56 of Medical Repository.

1812. Monograph of the G. Callitriche. On the Tuber rufescens of Sicily. On some new plants and animals. Reform of some Genera. Pamphlets.

1814. Compendium of my zoological and botanical discoveries, 63 N. G. and 116 N. Sp. Pamphlet, Palermo. Principles of Nomenclature and classification, ditto. Panphyton Siculum of Cupani, selection of 125 plates in folio, Palermo.

Cyclopedical Journal of Sicily, 2 vols. 4to. with several botanical essays, 20 N. G. of exotic plants, 15 new Sicilian plants, 14 new spunges, 2 N. G. Cryptogams, &c.

1815. Analysis of Nature, with new orders and families, Palermo, 1 vol. 8vo.

Chloris Etnensis or 4 florulas of Etna, in the Natural History of Etna of Recupero, Catania.

Prodromus of New Genera. Pamphlet.

1817. Florula Ludoviciana, containing 30 N. G. and 169 N. Sp. 1 vol. 12mo. N. York.

Florula Missurica, Mandanensis and Oregonensis. Pamphlet.

Reviews of Pursh, Eaton, Barton, Bigelow, &c. in Am. Monthly Magazine, N. York.

Museum of Natural Sciences or N. animals and plants in ditto, 3 decads of New York plants, some Sicilian plants.

1818. Review of Nuttall and Elliott, in ditto.

Discoveries in the Western States in ditto.

1819. Remarks on American Genera of plants, 50 N. G. of American plants and 70 N. G. of animals. In the Journal of Physique, Paris.

New plants, spunges and animals in Silliman's Journal, New Haven.

1820. Annals of Nature or 25 N. G. and 124 N. Sp. of animals and plants. Pamphlet, Lexington.

Sketch of the Flora of Kentucky, and several Tracts, in Western Review, Lexington.

Monographs of the Genera Rosa, Houstonia, Eustachya, Lysimachia, N. G. Enemion, Order of Rubiacea classed, and several other botanical tracts in ditto.

1821. Western Minerva, several N. G. &c. suppressed by my rivals!

1822. The Cosmonist, 20 numbers, Lexington.

New plants of Kentucky.

1823. Prenanthes opicrina and other plants, Cincinnatti.

1824. Florula Kentuckensis and Prodromus N. Sp. Lexington.

1825. Neogenyton or 66 N. G. North Am. plants, pamphlet, Lexington.

Neocloris or N. Sp. of Western America.

1826. School of Flora, with figures, Philadelphia.

1828. Medical Flora of the U. States, 1 vol. 50 plates, 12mo 2d vol. in 1830.

Neophyton Botanikon, or N. plants of N. America.

1830. American Vines—Botanical Letters to Decandolle.

1832. The American Florist 36 figs. 12mo. Philadelphia.

Atlantic Journal, Philada. 1832 and 1838, containing 150 N. G and Sp. of plants from Alleghanies, Florida, Illinois, Canada, Kentucky, &c.

1839. Herbarium Rafinesquianum or Prodromus of the new Sp. yet undescribed in his Herbal, 1 vol. Philada.

1815 to 1833. Autikon Botonikon or self figures of 2500 new or rare plants, chiefly collected in North America. Index to ditto, in three parts.

1833 to 1835. Additional Flora of North America, or the orders and families, Genera, Species and Varieties, omitted, misnamed or misplaced by Linneus, Wildenow, Persoon, Decandolle, Muhlenberg, Michaux, Lamark, Walter, Besc, Adanson, Necker, Agardh, Lindley, Pursh, Nuttall, Elliott, Leconte, Marshall, Darlington, Torrey, Bigelow, Beck, Eaton, Hooker, Schweinitz, &c.

1808 to 1838. Amenities of Nature, or collection of the principal essays of C. S. Rafinesque on the Natural Sciences, &c.

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155. GEOGRAPHY.

Discovery of Enderby Land in the Austral Ocean.

It had long been suspected that large tracts of land existed near the South pole. In February, 1831, Capt. John Biscoe, of

the Brig Tula belonging to Mess. Enderby of London, on a sealing voyage discovered under the Antarctic Circle a large extent of high-land, skirted by ice, which runs from N. E. to S, W. between Lat. 65 and 70 S. and between Long. 43 and 57 E. of Greenwich, to which he gave the name of Enderby land, and Cape Ann to a large cape on it. He could not come nearer than 20 miles of it, being prevented by a field of ice. Thus at last the Austral lands become gradually known.

In the same voyage Capt. Biscoe discovered a chain of Islands to the S. W. of the S. Shetlands, which he called Adelaide Islands. they are under the Antarctic Circle and near the west side of the great land of Gheritz, discovered in 1599, which has received so many names lately, South Greenland, South Spitsberg, Palmerland, &c. Capt. Biscoe deeming this west shore a discovery called it Graham land, it reaches as far as Lat. 68 due S. of cape Horn, running S. S. W.

This voyage of discovery has been deemed so important, altho' unprofitable to the owners, that they have sent again Capt. Biscoe to survey and explore these lands, and the admiralty has sent Capt. Rea to help him. The Society of Geography of London have also given their gold medal for 1832 to Capt. Biscoe as a reward.

156. GEOLOGY,

AND PHYSICAL FEATURES

Of the Atlantic plains of North America, by C. S. R.

They form great natural features of the physical geography and geology of North America, which have hardly been properly noticed as yet. The plains along the atlantic ocean, skirting the hilly primitive region, begin in New-Jersey in Lat. 41, and extend S. to Florida, thence W. to Texas, thence all around the gulph of Mexico to Yucatan, and even beyond to Veragua and Panama: forming thus a level litoral region nearly 4000 miles long, and from 100 to 150 miles wide on an average, the superficial Area exceeeding 400,000 square miles! the whole of which is level, with the exception of a few scattered and insulated hills of small elevation.

A volume could be written on the geography, geology and natural history of this vast region: my limits compel me to give merely a recapitulation of the principal features and phenomena of it.

1. These immense plains rise only 50 feet above tide water on average, or from 25 to 75 feet.

2. The surface is hardly undulated, the streams have excavated broad and shallow valleys and beds, with wide estuaries at their mouths.

3. They may be divided into several tracts, 1. the Northern as far as the Chesapeak bay.

2 middle tract from Baltimore to cape Hatteras. 3 Southern to Florida. 4 Florida tract, or peninsula. 5 Alabamian plains to Delta of Mississipi. 6 Texas, beyond the Delta. 7 Mexican tract. 8 Yucatan. 9 Honduras. 10 Mosquitto shore. Each of these tracts has peculiar features of its own, which it would be too long to detail.

4. The whole of these plains are unhealthy, chiefly in the warm season, except the sections of it called Pine barrens, Limestone tracts, and the Sea Islands.

5. The population is scanty, short lived, and subject to many kinds of fevers. The whole population does not exceed 10 per square mile on an average, or four millions for the whole.

6. Few cities are found there, Charleston, Savannah, New-Orleans, Vera Cruz, Tabasco, &c. which are in it, are all proverbially unhealthy for half of the year.

7. There are few springs, the streams generally coming from the hills beyond, or rise in swamps and lakes.

8. Swamps, marshes, and shallow lakes are very common, the waters of which are often colored as well as those of the streams flowing from them.

9 Many swamps are peculiar and wooded, covered by *Cupressus thyoides* and *disticha*, *Magnolias*, *Nyssas &c.* called cedar or cypress swamps &c.

10 The Pine barrens are large dry sandy tracts, wooded by pines chiefly, thus healthier than the swamps.

11. The soil is either wet or sandy, always light and poor, unless improved by marl or manure. Cotton is the main produce of the dry soil, and rice of the damp soil.

12. Near the hills a diluvial soil is often met of a better quality, which has been washed thereon, and along the streams a deep and rich alluvial soil is often found.

13. There are tracts of pure sand or gravel, totally unfit for cultivation, that produce only bushes or dwarf trees.

14. Along the Sea shore are salt marshes, flooded by the tides, but gradually left dry, and reduced to meadows.

15. The sea recedes from the shore at the average rate of 3 to 5 feet in a century, and the whole region may have been under water two or three thousand years ago.

16. The scatterred hills are chiefly of sand stone, pebble stone, shell stone, marl stone, &c., with fossil remains. The highest only rise from 100 to 150 feet high.

17. Under the soil or sand are found small marly pits, with beds of clay, fossil shells, remains of fishes and reptiles. The hollow swamps appear to be the outlets that ejected these clays, and overwhelmed the animals.

18. A brown or black coarse sand is found beneath the clay, compared to the green sand of

Europe, but holding other fossils. Then come other stratas of clays.

19. Bog Iron and iron stones are found in many places, but hardly any other metal or mineral.

20. Mosquitoes, flies and noxious insects are common every where, and very annoying.

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17. *American Travels published in 1838.*

Several important original travels have been published this year in the United States, two of which by ladies! such as

1. Observations on Texas, by Mrs. Holley, 1 vol. 12 mo. Baltimore, map. Very clever little book, and the best account of that country, now become a State of the Mexican Confederation.

2. Narrative of a voyage to the Pacific Ocean, by Mrs. Morrell, the wife of Capt. Morrell, 1 vol. 12 mo. New York, with her portrait. A delightful little boook, written with feeling and graphic descriptions.

3. Travels and researches in Natolia, Armenia, Georgia and Persia, in 1830 and 1831, by the Rev. Eli Smith and H. Dwight. Boston, 2 vols. 12 mo. map. American missionaries sent to explore Armenia. Some useful and curious facts.

4. Sketches of Turkey, by Dr. Dekay, New York, 1 vol. 8 vo fig. Well written, and much information on Constantinople, although known only a few months there. He praises the Turks more than the Greeks.

5. Voyage of Capt. Fanning round the world &c., 1 vol. 8 vo. New York, fig. Important, it embraces over thirty years of travels and discoveries by himself and others.

6. Travels in New Mexico and California, by Opattie Cincinnatti, vol. 12 mo. fig. Very interesting journal of a trapper and trader.

7. Account of an expedition to the Oregon or Rocky Mts. by Wyeth. Pamphlet, Boston. Trifling account.

VALEDICTORY.

As early as 1827 I proposed the publication of cheap Journals, weekly at one dollar per annum, daily at five dollars, and proved the possibility of these useful undertakings for the diffusion of knowledge. I was not believed then, as often happens with my useful projects, and no one would join me to begin the experiment.

In 1831 I issued proposals and in 1832 began the publication of this Atlantic Journal on my individual means and exertions. If I had been sustained in my endeavours to blend scientific with popular knowledge, I would have furnished the cheapest periodical in the United States, twelve numbers yearly of nearly 400 pages & 24 figures for one dollar! But this required a greater number of subscribers than I was able to

procure without importunity, and more exactitude in paying their small yearly sum. Instead of this cheap publication I have been compelled to reduce it to the usual rate, giving only a volume of 212 pages and 12 figures for two dollars; and yet by the lack of punctuality in subscribers, extra expenses of postages, &c. I have been a loser by my endeavours to produce a useful work.

Under these circumstances I am admonished after two years of exertions and expences to conclude this small undertaking, and close the volume, furnishing a title page and index thereto. The whole however will be found to be an original work containing many new facts and views. But, as I never despair of ultimate success, and must always be useful and active, I propose to begin in 1834 another periodical under a more suitable plan.

Meantime I have had the pleasure to perceive that my former plan of dollar magazines and journals, nay even five dollar dailies, has been successfully introduced both in America and Europe since 1827. We have now a crowd of popular journals or weekly periodicals, at one dollar per annum or one penny by the number, and even one cent a piece in France! Such European journals have great circulation and combine science with utility. Here ours are paltry imitations, but suit the taste of readers by furnishing them vapid trash and copied fiction, instead of science, truth and original essays.

Whereas my Atlantic Journal was too learned for these readers and chiefly patronized by enlightened or learned men, I propose in my future works to write chiefly for them, and to imitate the English plan of making learning dear and exclusive, since the public will have it so: since they prefer paying 800 dollars for a splendid book on Birds to one dollar for a work of 400 pages containing as many facts and discoveries. Thus I offer for sale the illustration of 33 years travels and researches, by 3000 figures for $ 1000, an unique manuscript work. Also my *Autikon Botanikon* of 2500 plants, unique copy for $ 500.

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A Register of Historical and Natural Sciences, Discoveries and useful Facts, latent knowledge restored, lost knowledge re-established, in events, facts and truths neglected or forgotten: chiefly on American Natural History and Annals.

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Published this year, The Herbarium Rafinesquianum, or New plants of my Herbal. Price One Dollar, but given gratis to those who subsbribed $ 2 for the Atlantic Journal.

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